

**The Integration of Violin and Voice for the Solo Performer:
A Set of Exercises, Studies and Short Pieces**

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Abstract

The violin has often been compared to the voice for its ability to connect with human emotions. Both violinists and vocalists have the ability to shape sound through pitch, timbre, dynamics and articulation, on a level as small as an individual note. Why then, despite these similarities, do so few musicians choose to play violin and sing at the same time?

Difficulties often arise because the violin and the voice both demand a similar kind of attention from the performer. Through a series of exercises and compositions, this paper explores intonation, timbre, rhythm, harmony and improvisation as they relate to a violinist/singer. In its entirety, it forms a method, by which a performer can learn to play violin and sing simultaneously. Some of the materials developed address general musicianship and so may also be useful in a broader pedagogical context.

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Chapter One: The Combination of the Violin and the Voice

There is very little music composed or performed by violinist/singers, and of what does exist, virtually none is written about. Four musicians, Iva Bittova, Andrew Bird, Owen Pallett, and Karla Kilsted stand out as having produced a significant amount of music as violinist/singers. Each of these performers possess a highly individualized approach to music, so few generalizations can be made of them. There also exists within the North American folk tradition and some European folk traditions, a style of fiddle accompaniment which is sometimes used to accompany the fiddler's own voice. Bruce Molsky is a notable fiddler/singer currently practicing this style of music.

In consideration of what has already been done, by both violinist/singers and by fiddler/singers, the author's intention is to develop her own unique style of singing and playing with the violin. The exercises and pieces presented in this paper are the author's exploration of the musical possibilities available to a violinist/singer. The author has found very little written information on the topic of singing and playing with violin, so most of the exercises and concepts, come from the author's own personal experience in combination with her awareness of the artists mentioned above.

The exercises in this paper are placed roughly in the order in which they should be practiced. Chapters 2 and 3 address timbre, intonation and blend between violin and voice. One must be comfortable with the exercises in these chapters before moving on, because they focus on sound itself. Other elements of music: melody, harmony, and rhythm, require both a violinist and a vocalist to possess the ability to shape sound before they are able to play clearly, let alone expressively. It is the amount of attention required for timbre and intonation that present the greatest challenge for a violinist/vocalist acting as a solo performer. Chapter 4 presents exercises focusing on rhythm. The author has found that rhythmic confidence brings other musical elements into focus. Once complex rhythms have been mastered with simple melodies and/or harmonies and clear tone, it is relatively easy to add melodic or harmonic complexity. Rhythm is especially important for a solo performer playing two independent musical parts at the same time. Both parts played must be rhythmically accurate for the entire performance to be

meaningful. The exercises in chapter 5 focus on melody and harmony, which can only be added in an intentional way after timbre, intonation and rhythm are stable. Finally, Chapter 6 presents a series of short studies for violin and voice, and chapter 7 presents four short pieces for string trio with voice. The studies and pieces in chapter 6 and 7 would not be possible for the author to perform as a violinist/vocalist without practicing the exercises presented in chapters 2 through 5.

When reading the chapters containing exercises, particularly chapters 2 and 3, one might wonder: "How is this paper a composition paper?" or maybe, more simply: "Where is the music?" The answer to this question (which will inevitably arise after reading through a few of the extremely simple, but meticulously detailed exercises which follow) is: the music is in understanding the rationale behind the exercises, and, in the very intentional act of practicing them. The exercises in chapters 2-5 (particularly in chapters 2 and 3) address creative elements of music which are usually not addressed by composers. Qualities like controlled timbre, balanced intonation, rhythmic accuracy, and an awareness of harmonic relevance all require creative thought. This is the same type of creative thought that is required for composition and improvisation, only on a different level. It is a level usually only left to performers, and not always identified as being creatively significant.

The exercises in chapter 2 and 3 are studies in sound itself in the form of written instructions. This type of writing could be compared to some of the compositions in Pauline Oliveros' *Sonic Meditations* (Oliveros, 1974). However, it would be misguided to take this comparison too far, because the purpose of the exercises in this paper is not to stand alone as compositions, but rather to act as studies which will enable a violinist/vocalist to perform more confidently. As a complete work, this paper should be contextualized as a set of studies, similar to Hans Sitt's *100 violin etudes: Op. 32*, or Frédéric Chopin's piano études, *Op. 10* and *Op. 25*. The technique focused on in the exercises in chapters 2 and 3 require them to be similar in presentation to Pauline Oliveros' *Sonic Meditations*. However, in terms of their purpose and in the context of the overall paper, they are better placed alongside the more conventional études listed above.

1.1 Unique Qualities of the Violin

Francis Hunt, piano tuner/retired trombonist, said in an interview with John Brizzolara "Perfect intonation is infinitely flexible." (Chicago Reader). Most string players will relate to Hunt's statement in a very real way. It is a description of what motivates a good portion of a violinist's practice. Perfection is by definition absolute, and a violinist strives for perfect intonation as if it is an absolute thing. But it is not. Fretless string players in the western world use a *twelve tone equal tempered*¹ system as their framework and then modify their intonation using the resonance of their instruments as a guide. String family instruments are tuned in perfect fifths, usually in reference to the "A" string where A=440. A violin, tuned for optimal resonance will not be perfectly in tune with a well-tuned piano. As well, the way in which the bow is pulled across a string on the violin (speed, angle, pressure and proximity to the bridge) all affect the timbre, articulation, dynamics and in some cases the pitch of the note being played (Campbell, Greated; Parker). The amount of attention given to sound itself on the violin presents a challenge for a self-accompanist because it leaves less room for consideration of other musical parameters such as rhythm and harmony. Timbre, intonation, resonance, articulation and dynamics are variables that must be considered more by fretless string players, than by traditional self-accompanists like pianists or guitarists.

1.2 Unique Qualities of the Voice

The voice is a remarkably distinct instrument for many reasons. The primary purpose of the voice is for communication, not for music.² Syllables, made up of vowels and consonants are the sounds of language, and have musical elements to them. They are pitched, rhythmic, and resonant, but they are not usually thought of as music in and of themselves. However, syllables are integral to the basic timbre of the voice even if linguistic meaning is absent. The specific timbral complexity of language is not present in any other instrument. The *international phonetic alphabet (IPA)*³ is a system used to describe the sounds of

1 Twelve tone equal temperament is a tuning system which divides the octave (ratio of 2/1) into twelve parts, all of which are equally spaced on a logarithmic scale. The smallest interval, a semitone is 1/12 the width of an octave. Twelve tone equal temperament is the most common tuning system in western classical music, and in modern times is usually tuned to A = 440Hz.

2 This does not necessarily imply that music cannot be a form of communication.

3 Please consult the IPA chart of vowel sounds, appendix A.

the voice (*phonics*⁴). The remainder of this paper will use symbols from the IPA when necessary to describe phonetic sounds.

The voice is also the only instrument most humans are born with and almost always learn to use from a young age, although not necessarily for singing. Before embarking on this project I believed that I knew how to sing because I knew how to speak, as well as sing my own music. To some extent I was right. I could sing my own songs accompanied by guitar and convey meaning through them, both linguistically and musically. However, my voice was limited in terms of range, dynamics, and timbre. Consequently, in terms of pure musical expression I did not have anywhere close to the flexibility that I had on the violin. I realized that I would have to begin to think of my voice as an instrument to be trained through practice, just as I had done with the violin. Since the voice is inside the body it is affected greatly by the condition of the body. If we are sick, or tired, or excited, or nervous the voice doesn't work in the same way. Consequently, learning to sing shares a lot of parallels with athletic training. Daily exercise of the correct muscles is essential. A parallel between athletic training and musical practice can be drawn for any instrument, but it is most significant with the voice. When we don't exercise the voice, the vocal instrument quickly becomes out of shape. This is different from most other instruments. When we don't practice for a short period of time our ability to play is affected, but the instrument itself is not.

Another unique element to the voice is that we cannot see how its sound is produced. For this reason many vocal teachers encourage visualization, even going so far as to have their students study all of the anatomy contributing to vocal production. My understanding of the structure of the vocal instrument has contributed a great deal to the development of my exercises. I also find visualizations related to pitch and/or timbral quality to be extremely helpful. Visualizations of sound can be useful to any musician, but they are especially useful to vocalists because there are no perceivable visual indications of pitch, timbre or volume in the voice. It is important to be aware that a visual understanding of the anatomy of the vocal instrument and visualizations of the sound the voice produces are not the same thing. However, they are both useful if understood in their appropriate contexts.

4 Phonetics is a branch of linguistics that comprises the study of the sounds of human speech. (O'Grady, Williams et al, 15).

Although there is a long history of vocal pedagogy it is only within the last forty to fifty years that modern science has begun to explain how the voice functions. As a result, some vocal methods are beginning to embrace and build on this understanding. The scientific approach to singing offers a basic understanding of how the physicality of the voice translates into sound. This approach is most useful to me as a trained violinist, because it allows me to relate to the voice as an instrument.

1.3 Articulation for Violin and Voice

In both the violin and the voice each individual note must be shaped with attention given to the beginning, middle, and end. Consonants in general can be paralleled to the many articulations possible at the beginning of each bow stroke on the violin. *Voiced consonants*⁵ can be paralleled to slow articulations like *collé*⁶; whereas *unvoiced consonants*⁷ can be paralleled to fast articulations like *spiccato*⁸. Pure vowel sounds on a single syllable can be paralleled to a sustained bow stroke. Diphthongs can be paralleled to a change in timbre mid bow stroke. Timbral change within a single bow stroke changes the resonance of the note and muddles the melodic line, just as diphthongs do in the voice. For an intentional sound on both the violin and in the voice there must be a solid understanding of the effect articulations have on the shape of each individual note as well as the shape of an entire phrase.

1.4 Bowing and Breath

Bowing is a large physical gesture. Effective bowing engages the entire back. A classical violinist holds his or her instrument between the shoulder and the jaw with the head slightly turned to the left. Efficient singing also engages the entire upper body. Proper breath control engages the front and the back rib cage, the abdominal muscles and the sternum. Bowing and singing engage some of the same muscles in the

5 Voiced consonants can be heard on their own. They don't have to be preceded by a vowel.

6 *Collé* translates to "stuck" or "glued" - a stroke that begins from a heavily weighted bow resting motionless on the string. Ideally, the initial weight will be almost enough to cause an undesirable scratch sound.

7 Unvoiced consonants don't make a sound unless they are preceded by a vowel.

8 *Spiccato* is a short staccato bow technique in which the bow bounces from the string.

back. This is both a psychological challenge and a physical one. It is difficult to pay attention to efficient use of breath and efficient bow control at the same time because many of the same muscles are being used in different ways.

I have addressed this challenge in two ways. The first is to train my body to connect bowing with breathing. The second is to practice phrasing related to bowing and phrasing related to singing separately and then put them together. The connection of bowing with breath is the easiest and most natural of the two. Breath contains within it a recurrent rhythm that is not metronomic. Phrasing a melody well is often best informed by the rhythm of breath. This is because melodies are often conceived with vocal phrasing in mind even if they aren't sung or intended to be sung. Violinists don't have to coordinate their breath with their phrasing, but it is useful to do so because it helps with good phrasing in many contexts. Unifying the bow and the breath works well if the violin and the voice are phrasing together, and is useful in most circumstances. When playing a harmony in rhythmic unison with the voice or accompanying the voice with a repetitive rhythmic texture, phrasing with breath works well. Most of the exercises and pieces in this paper aim to connect the phrasing of the bow with the phrasing of the breath.

However, coordinating bowing with breathing becomes problematic if the phrasing between the violin and the voice is staggered. In this context using breath to phrase the played line as well as the sung line will compromise the phrasing of one or both of the melodies. Another situation where bowing and breath may not be unified is one in which the sound of the breath is used musically. Both of these situations are addressed in this paper by isolating the violin and vocal lines with special attention given to the beginnings and endings of phrases.

1.5 Adjusting the Violin Hold to Free the Voice

A great deal of coordination is required in the mouth and throat to get a clear resonant sound throughout the vocal range when singing. Although it isn't necessary to sing with the face looking forward, the muscles around the pharynx and larynx are most relaxed in this position, making the voice feel and sound freer. The mouth, lips and face should also be free and relaxed to achieve ideal resonance

when singing. A Western classical violin hold, with the head turned to the left and the jaw on the chin-rest constricts the larynx and the pharynx and affects the shape of the entire vocal tract. The resonator for the voice is inside the body, and so the position of the body, especially the neck and the face, directly corresponds to the type of sound produced. In a Western classical violin hold the vibrations of a well resonated violin in are felt in the shoulder and jaw against the vibrations of a well resonated vocal tract. The collision of these sensations creates confusion for the violinist/vocalist.

Fortunately it is possible to be flexible with respect to the way that the violin is held and still achieve good resonance, controlled timbre, and good intonation on the violin. In order to address the discrepancies between the physicality of singing and the violin hold, vocal exercises should first be practiced in front of a mirror without the violin. The postures and face positions in which the voice feels comfortable and sounds free in different parts of the vocal range should be observed. Once these postures become automatic while singing, the violin can then be added in accompaniment to the voice; first with the violin playing in unison with the voice, and then with the violin playing in harmony with the voice. The same position in the face, neck and overall posture when singing without the violin should be maintained when singing with the violin.

1.6 Balancing the Volume Between the Violin and the Voice

The sound the violin produces comes mainly out of the f holes, which, in a Western classical violin hold are almost directly under the player's left ear. As a result, violinists generally have an exaggerated perception of the volume their instrument projects. A singer's perception of the volume he/she produces is not exaggerated because the sound of the voice initially moves away from both of the ears. This difference in perception of volume for a violinist and a singer make it difficult for the violinist/singer to accurately perceive a well blended sound. Initially when I began singing and playing violin at the same time I felt like my voice was always competing with my violin. However, when I recorded myself, I realized that most of the time my voice was actually louder than my violin. I propose two strategies to address this problem. The first is to change the violin hold, moving the violin away from the head and supporting it more with the left hand than with the jaw. As stated above, this posture is also more

conducive to producing a clear resonant sound with the voice because it frees the vocal resonator. The second strategy is to try to retrain one's perception of the blend between the violin and the voice. This involves two processes. The first is for the violinist/singer to play and sing into an omnidirectional microphone with headphones on. The microphone picks up a violin/voice blend closer to what an audience member would hear in a live situation, while the headphones moderate the exaggerated volume of the violin. The second is to record any short piece or excerpt, and then re-record the same piece making adjustments to the volume of the voice and the violin accordingly. Both methods are useful for different reasons. The first gives immediate feedback, but not is realistic for most performance situations. The second does not give immediate feedback, but is better preparation for live performance.

Chapter Two: Exercises on Timbre and Intonation Based on the Voice

Because the voice is dependent on the condition of the body it is more temperamental than the violin. It needs to be exercised daily and taken care of in order to produce a reliable sound. The exercises based on the resonance of the voice come first in this paper because their practice is a precursor to all the other exercises.

There is an element of flexibility in all of the exercises. Flexibility is essential when addressing timbre and intonation on both the violin and in the voice because there are far too many variables contributing to the sound of these instruments for a purely methodical solution. The comfortable range of any human voice varies from day to day and it is harmful to the voice to practice things that feel uncomfortable. There is a general range for each exercise in chapter 2 that will optimize its effectiveness, but in order to accommodate day to day changes in the voice, the exact range needs to be somewhat flexible. For this reason all of the starting and ending pitches for the exercises in chapter 2 are assumed to be approximate.

The best way to practice all of the exercises in this paper is with a clearly defined intention as the primary guide, rather than a strictly defined process. To train timbre and intonation on the violin and in the voice is to train both the ear and the body to pay attention to detail.

Please note: *Scientific pitch notation*⁹ will be used to refer to specific pitches for the remainder of this paper.

⁹ *Scientific pitch notation* (SPN), also known as *American Standard Pitch Notation* (ASPN) and *International Pitch Notation* (IPN) is a method of specifying musical pitch by combining a musical note name (with an accidental if needed) and a number identifying the pitch's octave. Middle C on the piano is labelled C4, the C above middle C is labelled C5, and the C below middle C is labelled C3. All of the notes within one octave are assigned the same octave number. So D above middle C is labelled D4, E above middle C is labelled E4, and so on. The octave number increases by 1 upon an ascension from B to C. (Goss)

2.1 Humming with the Violin

Humming is an effective way to practice *flow phonation*¹⁰, and should be done near the beginning of the warm-up after other *downstream register articulations*¹¹ such as tongue or lip trills. For most singers, tongue and lip trills are more effective physical warm-ups than humming, because they are more difficult to maintain without flow phonation (Titze, 51, 52). However, humming is more conducive to blending with the violin because it creates a pure tone, and a wide dynamic range is possible within one breath, similar to a bow stroke. The effort that goes into uniting the physical benefits of humming with the more mindful practice of blending, helps transfer the sensation of efficient phonation from a mostly physical place in the mind to a more musical place, making the sound itself more readily available for other musical situations. The reason the mouth opens to form a vowel sound on the descending portion of the fifth set of the *Humming with the Violin - Basic Exercise* described below, is to transfer the flow phonation necessary for humming to open mouth singing. In order for this transfer to be effective it is important to pay close attention to the feeling in the larynx when the mouth opens.

Although physical sensations of vibration do not always translate into sound they are useful cues for both a singer and a vocalist. *Humming with the Violin* is performed well if *secondary vibrations*¹² from the voice are felt in the chest during *mode 1*¹³, the mask during *mode 2*¹⁴, and in the fingers of the violin hand during the entire exercise. These sensations indicate good resonance and intonation in both the violin and the voice. *Humming with the Violin* should first be practiced in front of a mirror with attention

10 Flow phonation, also termed ideal phonation, has a breath pressure/airflow ratio of 1 (Bozeman, 108).

11 "A downstream register articulation is any articulatory function that requires or resists airflow downstream from the vocal folds, i.e., nearer or at the lips. If the resister is a vibrator, like a tongue or a lip trill, it will require a steady airflow and pressure to be vibrated." (Boozeman, 93)

12 Vocalists often feel *secondary vibrations* in places in the body that do not actually contribute to the resonance of the voice. Although there are general tendencies in terms of where secondary vibrations are felt, the exact placement is not consistent from singer to singer.

13 Mode 1 is a term used to describe the way (or mode) in which the vocal folds vibrate (not to be confused with musical mode). Historically, the term "chest voice" has been used to describe an approximation of this register because many people feel its secondary vibrations in the chest. The use of the term chest voice to describe a vocal register has been disputed by many vocal pedagogues and vocal scientists because chest vibrations are not what is causing the timbral quality in the voice, and therefore the term is used inconsistently by different people. Vibrational modes: 0 (traditionally called "vocal fry" or "pulse"), 1 (traditionally called "chest" or "lower register"), 2 (traditionally called "head," "upper register," or "falsetto") and 3 (traditionally called "whistle," "falsetto," or "flute") describe actual physical changes in the way the vocal folds vibrate, which correspond more closely to timbral changes in the voice. For this reason they are more useful terms and will be used for the remainder of this paper to describe vocal registers. (Thurman, Welch, Theimer and Klitz)

14 Mode 2 is a term used to describe the way in which the vocal folds vibrate, historically called by many names including "head voice" and "upper register" and "falsetto" (see above).

given to the face shape and posture which creates the most resonance in the voice. The violin hold should accommodate whatever posture is necessary to support the voice.

Humming with the Violin - Basic Exercise

1. Play a bow stroke on A3.
2. Change the bow direction and play and hum scale degrees 1-2-3-4-5-4-3-2-1 of the major scale in unison starting on A3. Change the direction of the bow on scale degree 5.
3. Move up chromatically to Bb3 and repeat steps 1 and 2.
4. Continue moving up chromatically and repeat the pattern for five sets.
5. Begin the fifth set humming, and then on scale degree 5 open the mouth slightly to say "me" on the descending part of the scale.
6. Continue the exercise as in step five, moving up chromatically to F4.
7. Move back down the chromatic scale repeating the sets, humming while ascending, and singing while descending.

Watch an example here: https://www.youtube.com/watch?v=D_eyvmwfAqs

Please note: The above example is a harmonic variation of the basic exercise outlined above. The voice and violin move in parallel thirds. This, and other melodic/harmonic variations of the basic exercises are described in section 2.6

Humming with the Violin - Variation 1

Repeat steps 1-4 of *Humming with the Violin*. On step 5, instead of opening the mouth and singing me (hum+ [i]), open the mouth and sing: mah (hum + [ɑ]) or another variation moo (hum + [u]). For each of these variations, continue on to steps 6 and 7.

2.2 Preparing Vocal Onset with Breath

The intention of exercises described below is to teach the body to coordinate clear *vocal onset*¹⁵ with the

15 Vocal onset refers to how sound is initiated in the voice. Beginning sung notes with the pharynx in a low position is ideal for a clear resonant sound. The act of yawning naturally raises the soft palate and lowers the pharynx. Breathing out through the nose before starting to

initiation of a bow stroke. The most basic variation of these exercises limits the difficulty in the violin part in order to allow the sole focus to be on the breath/bow coordination. Variation 1 and 2 require that the mind is actively involved in *audiating*¹⁶ for both the violin and the voice, because they include both shifting and *glissandi*¹⁷ in the left hand. Prior to my work on this paper, part of my intonation practice as a violinist included audiating pitches before playing them. This practice is especially useful when the interval cannot be mapped out in the hand/fingers, but has to be leapt to by moving the entire arm (what string players call shifting¹⁸). When I began to combine my violin and my voice, the situations that required shifting on the violin created some of the biggest problems with intonation. I soon realized that the audiation I had developed for shifting was the same audiation I was using for singing. I had trained my brain to audiate one note and sing it, or to audiate two notes and play them on the violin, but I hadn't trained it to tell my voice and my fingers what to do at the same time.

Because Variations 1 and 2 of *Preparing Vocal Onset with Breath* (outlined below) involve shifting, the pitch must be audiated and then prepared on both the violin and in the voice at the same time. Part of this preparation includes a conscious connection between the act of breathing in through the mouth with the act of shifting on the violin, and the act of sighing out with the beginning of a bow stroke. Variation 1 prepares the mind for variation 2 by slowing down the part of the exercise that involves shifting, and drawing attention to it with a *ghosted glissando*¹⁹. This brings the audiation required for shifting and the audiation required for accurate pitch placement in the voice into the forefront of the mind. Thus allowing the practitioner to create separate mental pathways for pitch preparation on both the violin and in the voice.

A secondary focus of variations 1 and 2 is to isolate and balance the physical requirements of clear vocal onset in the voice with the physical requirements of shifting and glissandi on the violin. Shifting and

sing helps to keep the soft palate raised. (Shepard, 58-59, 77, 114).

16 *Audiation* is to sound in the same way that imagination is to images. It is the ability to imagine a sound or piece of music without actually hearing it. This term was coined by music education researcher Edwin Gordon in 1975.

17 *Glissando* - from the french verb glisser (to glide) - a glide from one pitch to another.

18 *Shifting* on a violin is when the entire hand moves up or down the fingerboard into a new *position*. A position on the violin is defined as notes that can be reached by the four fingers on one string without moving the hand.

19 *Ghosted glissando* is a term invented by the author to describe a barely audible glissando which is created by sliding a finger up a string without fully depressing the string to the fingerboard. This is not to be confused with the term: *ghost note* (used most commonly in jazz) which refers to a musical note of specific rhythmic value, but no discernible pitch.

glissandi of large intervals create a physical challenge for the violinist/singer as they require the violin to be at least somewhat supported by the shoulder and jaw, which interferes with the voice. Also, I have noticed that I have a tendency to stop breathing when shifting, due to the amount of attention that is required for pitch placement. Connecting shifting to breath and vocal onset through isolation will help correct this problem.

Another focus of variations 1 and 2 is to smooth out the turning points in the voice. Practicing a descending glissando through turning points is a good way to achieve a smooth transition between registers (Sheppard, 77).

Preparing Vocal Onset with Breath - Basic Exercise

1. Take a comfortable breath in, as if to yawn.
2. Leave the mouth slightly open and breath out of the nose and the mouth.
3. As soon as you feel the air passing through the nose, sigh out gently on "ha" (h+[ɑ]) starting on a high note and moving to a low note.
4. Play a bow stroke on the violin starting with C4.
5. As you get to the end of the bow stroke breath in as if to yawn.
6. Repeat steps 2-3 and play another bow stroke, using the first half of the bow for G4 and the second half of the bow for C4. As you play, sigh on "ha" from G4 to C4 in unison with the violin. The voice and the violin should sound smooth and legato.
7. Ascend one pitch chromatically and repeat steps 4-6 for 7 sets, ending on G4 and D5.

Preparing Vocal Onset with Breath - Variation 1

1. Play a bow stroke on the violin starting with C4.
2. As you get to the end of the bow stroke breathe in as if to yawn. While breathing in, slide your finger up a perfect fifth without depressing the string. At the same time continue to draw the bow with just enough weight to keep it on the string. This will result in a barely audible or ghosted glissando and will enable you to hear the perfect 5th come into tune.

3. Sigh on the out breath, starting on G⁴ and descending to C⁴. On the violin, glissando in unison with the voice.

4. Ascend one pitch chromatically and repeat the set about seven times, ending with G⁴ and D⁵.

Watch an example here: https://www.youtube.com/watch?v=T7_vxzqgvoU&feature=youtu.be

Preparing Vocal Onset with Breath - Variation 2

Repeat step 1 of variation 1. On step 2 speed up the ghosted glissando until it is inaudible and becomes a shift rather than glissando. In this case the breath will have to begin near the end of the first bow stroke.

Repeat steps 3 and 4 of variation 1.

Preparing Vocal Onset with Breath - Variation 3

1. Bow the double stop G⁴ and D⁵.

2. As you get to the end of the bow stroke breathe in as if to yawn.

3. Repeat steps 2-3 from the basic version of this exercise, and on a second bow stroke, descend through scale degrees 5-4-3-2-1 from D⁵ to G⁴. As you play, sigh on the sound "ha" in unison with the violin.

Both the violin and the voice should sound smooth and legato.

4. Descend one pitch chromatically and repeat the set seven times, ending on C⁴ and G⁴.

Watch an example here:

<https://www.youtube.com/watch?v=I040tyCc9Ys&feature=youtu.be>

Please note: The above example is a harmonic variation of the basic exercise outlined above. The voice and violin move in parallel thirds. This, and other melodic/harmonic variations of the basic exercises are described in section 2.6.

Preparing Vocal Onset with Breath - Variation 4

Practice the basic exercises and first three variations with other vowel sounds, sighing out on "hee"(h+[i]), "hoo"(h+[u]), "ho"(h+[o]) and "hay"(h+[e]).

2.3 Formant Blending Exercise

The goal of the *Formant Blending Exercise* (outlined below) is to blend the timbre of the voice with the timbre of the violin while maintaining a focused tone and pitch through a range of vowel sounds. In both the basic exercise and in variation 1, the voice transitions from the *close vowel*²⁰ [i], through three more *open vowels*²¹ [e] [ɑ] and [o], back to the close vowel [u]. It is easier to achieve a focused sound on close vowels like [i] and [u], whereas it is easier to sing [e] [ɑ] and [o] with less focus and more breath. The process of moving through vowel sounds while consciously trying to maintain a blended sound encourages the transfer of the inherent qualities from one vowel sound to the next, so that open vowels take on some of the qualities of close vowels and vice versa. This helps increase the timbral range across all vowels. It is important to practice timbral blending exercises with the violin so that the timbre of the violin has an impact on timbral choices made in the voice. In the basic version of the *Formant Blending Exercise* the violin articulates the change between vowel sounds with *pulls*²² on the bow. This obscures the transition between vowel sounds, making the blending work slightly easier than it would be with an unarticulated tone. In *Formant Blending Exercise - Variation 1* the pulls in the bow are eliminated, requiring the voice not only to blend with the violin on different vowels sounds, but also to blend with the violin on the transitions between vowel sounds.

Formant Blending - Basic Exercise

1. Play a bow stroke on G3.
2. While playing a second bow stroke, sing through vowel sounds [i] [e] [ɑ] [o] [u] in one breath. Mark the change in vowel sound with a pull on the bow without accenting the changes. Changes between vowel sounds should be legato and blend with the pitch and timbre of the violin.
3. Breathe, change the direction of the bow, and sing [u][o][ɑ][e][i], moving back through the same vowel sounds in the opposite direction.

20 Close refers to the distance of the tongue from the roof of the mouth. Vowel sounds in which the tongue is close to the roof of the mouth are described as close. It is important for singers to categorize vowel sounds, because each vowel sound creates a different resonance in the voice. These different resonances are described as vocal formants. (Sheppard, 83-86)

21 Open refers to the distance of the tongue from the roof of the mouth. Vowel sounds in which the tongue is far from the roof of the mouth are described as open. (Sheppard, 83-86)

22 Pulling is a semi-legato technique used in fiddle playing to articulate rhythm. In the middle of a bow stroke, the bow slows slightly and lightens without losing contact with the string, and then starts again with a faster "pull" articulating the rhythm with a soft slow accent.

4. Repeat steps 1 - 3 starting on Ab3. Move the sets up chromatically to D5.
5. After practicing in the upper register, start with the voice on G3 and the violin an octave above. Move the sets down chromatically to C3 with the voice and C4 with the violin.

Formant Blending - Variation 1

A slight variation of this exercise is to eliminate the pull from the bow articulation in step 2. This requires that the changes in vowel sounds be even more legato in order to blend with the sound of the violin.

2.4 Upper Register Exercise

The goal of the *Upper Register Exercise* (outlined below) is to try to maintain similar dynamics and timbre in the voice from the middle to upper register (mode 3), using the timbre of the violin as a guide. Because high notes correspond to taut *CT muscles*²³ in the vocal folds they often trigger tightness and stretching in other muscles. When performing this exercise, it is important to remain very relaxed and let the intended pitch guide the physical movements in the vocal instrument. One helpful visualization for this exercise is to imagine the high note of the arpeggio placed between the eyes.²⁴ Another is to think of pitches in the voice as keys on a piano. This gives all of the pitches in the voice a similar association in terms of level of difficulty.²⁵ These types of visualizations diminish the tendency to tense the muscles around the larynx and "stretch" for the high notes by distracting the singer from associations of "high" with tight, "high" with difficult, or "high" with physically high.

Arpeggios are a good way to practice singing in the upper register of the voice because the highest notes are isolated, and therefore more approachable. The upper register (mode 3) of the voice is not commonly used in speaking, so it is initially tiring to practice scalar passages in this range. It is especially important to free the vocal tract for this exercise, supporting the violin more with the left hand than with the jaw.

23 The primary function of the *cricothyroid (CT)* muscles appears to be lengthening and closing the vocal folds. (Thurman, Welch, Theimer and Klitz).

24 Visualizing high notes between the eyes was suggested to me in a lesson with Christine Duncan.

25 Imagining the voice as a keyboard instrument was suggested to me in a lesson with Rita Di Ghent and has been suggested in numerous vocal method books and videos online.

Upper Register - Basic Exercise

1. Bow the double stop D⁴ and A⁴.
2. On the vowel [i] play and sing scale degrees 1-3-5-8-5-3-1 with a bow change on scale degree 8. Open the mouth a little wider on the highest note of the arpeggio by lifting the top of the mouth and relaxing the neck rather than dropping the jaw. The entire arpeggio should be sung up and down in one breath in a legato manner.
3. Ascend chromatically and repeat steps 1 and 2 for seven sets.

2.5 Lower Register Exercise

The goal of the first part of the *Lower Register Exercise* (outlined below) is to achieve a timbral blend between the lowest range in the voice and lowest range on the violin. The goal of the second part of the exercise is to achieve a smooth transition between mode 1 and mode 2 in the voice, while blending with the violin. The warmer qualities of mode 1 in the voice should be preserved as much as possible in the second part of the exercise. The voice should be as legato as possible, and the timbral transition between mode 1 and mode 2 as minimal as possible. The vowel modification should be very subtle, guided by what feels good, and sounds most resonant. The double-stop octaves on the violin in this exercise require shifting. This necessitates audiation for both the violin and voice, as well as negotiation between the physical requirements for the stability of the violin hold and the physical requirements for vocal freedom.

Lower Register - Basic Exercise

1. Bow a double stop on G⁴ and D⁵.
2. On a new bow stroke sing and play scale degrees 5-4-3-2-1 with the voice an octave lower than the violin (D⁴-C³-B³-A³-G³). Start the set on the vowel sound [ɑ] and modify towards [ɔ] or [o] whichever feels more comfortable.
3. Repeat steps 1 and 2 with the violin starting on Gb⁴ and Db⁵, and the voice starting an octave lower.
4. Repeat steps 1-2 for 6 sets, moving down chromatically for each set.
5. Bow a double stop on Db⁴ and Db⁵.
6. On the next bow stroke sing Db³-Db⁴-Db³ with the violin in rhythmic unison an octave above. Start

on [ɔ̃] or [o] and modify towards [ə] on the top note.

7. Move up chromatically and repeat steps 5 and 6 for 9 sets. When you reach G4 and G5 on the violin drop down an octave with the violin so that the voice and the violin are in unison.

2.6 Melodic and Harmonic Variations for Chapter Two

The focus of chapter two is the voice. First, to exercise the voice, and second, to blend the violin with the voice. For the most basic forms of the exercises the musical elements are intentionally kept very simple so that the focus remains on the physicality of the voice. It is important for the health and strength of the voice to practice the types of exercise outlined in unit two daily. Musical simplifications are necessary initially until the physicality of the exercises, especially in the voice, become at least partially automatic. However, any melodic concept that is practiced daily will become a more heavily weighted part of an improviser/composer's musical language. In order to maintain a balanced musical vocabulary, as well as to stay alert when practicing, it is important to incorporate flexibility and variety in any activity that is practiced daily. Most of the exercises in unit two overlap a great deal in terms of musical pattern. For this reason it is possible to apply the same melodic and harmonic variations to the majority of them. Scale degrees rather than notation have been used to describe all of the exercises in unit two, so that melodic and harmonic variations can be easily applied.

Variation 1 - Change the Mode

Once all of the exercises in unit two are comfortable, practice the entire routine in a different mode each day. Start with the modes of the diatonic scale, moving from brightest (Lydian) to darkest (Locrian)²⁶.

Practicing the modes in order from brightest to darkest helps to train an intuitive awareness of the overall pattern governing the modes.²⁷ This kind of understanding is extremely important for vocal training because there are no spatial cues for pitch. It is also relevant to the violin because once the

26 I am defining the shade of the musical modes by the placement of the minor seconds. In brightest mode (Lydian) the minor seconds occur closest to the top of the mode. In the darkest mode (Locrian) the minor seconds occur closest to the bottom of the mode.

27 The only difference between Lydian and Ionian is a minor second between scale degrees 4 and 5 (Lydian) and 3 and 4 (Ionian). Continuing in a darker direction, the only difference between Ionian and Mixolydian is a minor second between scale degrees 7 and 8 (Ionian) and 6 and 7 (Mixolydian). When ordered from brightest to darkest the semitones continue moving backwards down the modes toggling between a change in the lower half of the mode and a change in the upper half, until finally the tonic has to drop by one semi-tone, and the mode again becomes Lydian.

inherent qualities of the modes are fully understood, characteristic intervals can be widened or narrowed slightly to strengthen the feeling of the mode. Once the modes are comfortable, other scales can be added into the rotation. *Figure 2.1* below includes a variety of scales for practice.^{28 29} Each of the heptatonic scales³⁰ in *figure 2.1* has one or two related pentatonic scales written beside it. The *pentatonic*³¹ scales are to be practiced in conjunction with their related heptatonic scales. They can be used in place of, or in addition to arpeggios in the Upper Register Exercise (section 2.4). Arpeggios are written next to the whole tone scale and the half whole-tone scale. These are intended to be practiced with the whole tone scale and the half whole tone scale respectively.

28 The author invented the name *double harmonic minor* to describe the characteristic tone and a half in harmonic minor occurring symmetrically at the top and bottom of the scale.

29 The minor-major scale is also commonly called melodic minor ascending.

30 A *heptatonic* scale is a group of seven notes within an octave.

31 A *pentatonic* scale is a group of five notes within an octave.

The image displays 14 musical staves, each representing a different scale and its associated pentatonic variations. The scales are listed on the left of each staff, and the pentatonic variations are labeled above the staff lines.

- Staff 1:** Lydian scale, followed by Pentatonic 1 and Pentatonic 2.
- Staff 4:** Ionian scale, followed by Pentatonic 1 and Pentatonic 2.
- Staff 7:** Mixolydian scale, followed by Pentatonic 1 and Pentatonic 2.
- Staff 10:** Dorian scale, followed by Pentatonic 1 and Pentatonic 2.
- Staff 13:** Aeolian scale, followed by Pentatonic 1 and Pentatonic 2.
- Staff 16:** Phrygian scale, followed by Pentatonic 1 and Pentatonic 2.
- Staff 19:** Locrian scale, followed by Pentatonic 1 and Pentatonic 2.
- Staff 22:** Harmonic Minor scale, followed by Pentatonic 1.
- Staff 24:** 5th mode Harmonic Minor scale, followed by Pentatonic 1.
- Staff 26:** Double Harmonic Minor scale, followed by Pentatonic 1.
- Staff 28:** Harmonic Major scale, followed by Pentatonic 1.
- Staff 30:** Minor-Major scale, followed by Pentatonic 1.
- Staff 32:** Whole Tone scale, followed by Augmented triad.
- Staff 34:** Half-Whole scale, followed by Two Fully Diminished 7th Chords.

Figure 2.1- Scales for Chapter 2 Melodic Variations

Variation 2 - Voice over a Violin Drone

Instead of playing the violin in unison with the voice, play a sustained note under the melodic pattern. If it is a five-note pattern start with scale degree 1, then 5, then 3, then 2, then 4. If it is an arpeggio or a pentatonic scale start with scale degree 1, then 5, then 3, then 7, then 6, then 2, then 4. Change the bow direction at the same place as in the basic exercise. After a single sustained note is mastered, a double stop can be added. Start with a diatonic 5th above the initial sustained note, then a diatonic 4th below, then a diatonic 3rd above, then a diatonic 6th below.

Variation 3 - Violin over a Vocal Drone

Instead of humming or singing the pattern from the exercise, hold a sustained note from the pattern and play the pattern on the violin. If it is a five-note pattern start with scale degree 1, then 5, then 3, then 2, then 4. If it is an arpeggio or a pentatonic scale start with 1, then 5, then 3, then 7, then 6, then 2, then 4. Change the bow direction at the same place as you would in the basic exercise. Please note, this variation will not exercise the voice in the same way as the other variations. Since the focus of chapter two is the training of the voice this variation should be practiced in conjunction with another variation of the same exercise.

Variation 4 - Harmonize at a Parallel Interval to the Voice

Play an interval in parallel motion to the voice. Start with the violin a diatonic 3rd above the voice, then a diatonic 6th below, then a diatonic 6th above, then a diatonic 3rd below, then a diatonic 5th above, then a diatonic 4th below. Please note: harmonizing modes at different intervals will obscure their unique qualities. Part of the mental work in this exercise is to be aware of the consequences of the different harmonizations, while remaining focused on the mode in use on a particular day.

Variation 5 - Rhythmic Accompaniments

On scale degrees 1 and 5 use any of the double stop rhythmic accompaniment figures from chapter four.

Chapter Three: Exercises on Timbre and Intonation Based on the Violin

The exercises in chapter three explore the resonance of the violin as it relates to the voice. During one of my improvisations with violin and voice I noticed that I was able to set my A string into resonant vibration with my voice just by singing. Listen to what it sounds like here:

<https://soundcloud.com/cassienorton/resonating-the-open-a-string-of-the-violin-with-the-voice>. I found that this was also possible with the D string, but not with the E and G strings. This could have to do with the *MAR* and the *MWR* ³² on my violin, or with the resonance in my voice in that particular range. Either way, I thought the bolstered resonance of the open strings was worth further exploration. In consideration of the resonance of the violin, all of the exercises in chapter three are to be practiced in the four *tonalities*³³ that correspond to each of the open strings (G,D,A,E) within the limitations of the vocal range. Once mastered in these four tonalities they can be practiced in all twelve tonalities within the limitations of the vocal range. When practiced in tonalities that aren't acoustically bolstered by the violin's formants, the exercises will become more about a pure blend between the violin and the voice, rather than drawing attention to the resonance of the violin.

3.1 Tuning Exercises

The primary purpose of the *Tuning Exercises* (outlined below) is to increase physical awareness of the resonance of the open strings on the violin and the same pitches in the voice, thus strengthening the connection between the resonance of the violin and the resonance of the voice. Another function of these exercises is to increase awareness of the beginnings and endings of notes. Finally, these exercises aim to develop stability of pitch and timbre with the violin and the voice both solo and in unison, as well as to develop a connection between the two.

32 The violin body has two resonant frequencies, the main wood resonance (MWR) and the main air resonance (MAR).

33 A set of pitches heard in relation to the same fundamental pitch. The fundamental is the pitch that the key is named after.

Tuning Exercise - Variation 1 - Tuning the Voice to the Violin

1. Play one bow stroke on an open string.
2. Play a second bow stroke on an open string. Shortly into the second bow stroke sing the same note. Try to match the pitch, timbre and volume of the violin. Pay close attention to the entrance of the voice. Try to imagine the note accurately before singing. Do not slide into the note or change the timbre or pitch of the note after starting.
3. Continue singing the note after completing the bow stroke. Be aware of the end of the bow stroke, and try to make it inaudible. Ideally, the sound of the solo violin, the violin voice combination, and the solo voice should be heard as one event with minimally apparent transitions.

Listen to an example: <https://soundcloud.com/cassienorton/voice-mimics-the-violin-open-a>

Tuning Exercise - Variation 2 - Tuning the Violin to the Voice

1. Sing one of the open string pitches: G, D, A, or E.
2. Take a breath, and try to sing exactly the same note again: same pitch, timbre, and length. Shortly into the second note begin a bow stroke. Make the entrance of the violin as inaudible as possible.
3. Continue bowing after completing the sung note. Be aware of the end of the sung note. Try to make the transition between violin and voice and solo violin as inaudible as possible.

Listen to an example: <https://soundcloud.com/cassienorton/violin-mimics-the-voice-open-d>

3.2 Imitation Exercises

Being aware of the articulation and shape of each note is important for both violin playing and singing, but the physical technique for making similar sounds are very different. Consciously mimicking specific sounds back and forth between violin and voice helps create connections in the brain between the sounds themselves and the physical actions involved in producing them on each instrument. This connection between sensitivity toward sound, and violin/vocal technique is necessary to create a blend between the violin and the voice, as well as to create a shared timbral language between the two instruments. The *Imitation Exercises* (outlined below) should be approached in two different ways. The

first is to mimic the initial sounds intuitively. Play or sing the initial note, and when it comes time to mimic, play or sing whatever articulation feels most natural. The second is to come up with specific sounds on the violin and match them with specific sounds in the voice and visa versa. The first approach allows the brain to be open to new ideas and connections because there is not time for judgement to get in the way. The second approach allows time and focus to address potential coordination problems between violin technique and vocal technique. It also allows the conscious thought and awareness that is necessary to develop and build on ideas that may initially have been realized more intuitively.

Imitation Exercise - Variation 1 - The Voice Mimics the Violin

1. Play one bow stroke on an open string. Pay close attention to the articulation at the beginning of the bow stroke.
2. Play a second bow stroke on an open string. Try to make the second bow stroke identical to the first. At exactly the same time as the bow stroke begins, sing the same pitch. Try to match everything about the note on the violin: articulation, pitch, timbre, and volume. Focus on how voiced and unvoiced consonants compare to fast and slow articulations on the violin.
3. Shape the note on the violin and in the voice in a similar way. Focus on which vowel sounds work best with the sound of each string on the violin. Finish both the bowed note and the sung note at the same time and in a similar manner.

Listen to an example here: <https://soundcloud.com/cassienorton/voice-mimicks-the-violin-slow-accent-paired-with-ba>

Imitation Exercise - Variation 2 - The Violin Mimics the Voice

Variation 2 is similar to Variation 1, only the roles of the violin and the voice are reversed. The violin now mimics the sound of the voice.

Listen to an example here: <https://soundcloud.com/cassienorton/violin-mimicks-the-voice-accent-paired-with-grr>

3.3 Glissando Exercises

The *Glissando Exercises* (outlined below) help to separate and refine the audiation which guides intonation on the violin from the audiation which guides intonation in the voice. In variation 1, glissandos and shifting are practiced on the violin alone. This helps to create mental pathways between audiation and pitch accuracy on the violin before the voice is added. In variation 2, vocal glissandos are practiced over an open string drone (sustained note), thus creating mental pathways between audiation and pitch accuracy in the voice. Although the violin is included in variation 2, minimal audiation is required for the violin, because no shifting is involved. In variation 3 the voice must maintain a drone underneath the violin glissandos. In order to achieve this, the brain must be taught to split its focus between maintaining the same pitch in the voice and preparing violin glissandos. The majority of the attention must be given to the moving line on the violin, while remaining grounded in the drone of the voice. Variation 4 combines the first 3 variations, requiring the voice and the violin to perform the glissandos in unison.

All of the activities involved in variations 1-4 require different kinds of attention because the process of singing in tune and playing violin in tune are physically very different. The need to separate audiation on the violin and the voice in order to play and sing in tune is explained in the introduction to exercise 2.2. The importance of this process cannot be overstated. After practicing this set of exercises regularly for about a week, everything else I had been working on with violin and voice became much easier. The weight shift from left to right while singing an ascending glissando, and right to left while singing a descending glissando in variations 2 and 4 helps separate the audiation used for the violin, and the audiation used for the voice. This is because the pitch of the voice becomes attached to a conscious movement in the body, just as the pitch of the violin is attached to a conscious movement in the hand and fingers. In summary, variations 1-4 isolate and then recombine the audiation that is necessary to perform a unison line involving shifting and/or glissando on violin and voice.

A secondary intention of this exercise is to notice how the most resonant pitches on the violin feel in the voice, and to develop a violinistic sense of intonation in the voice. The open strings and their overtone

series have a stronger resonance than other notes on the violin. The exact chromatic pitches chosen in both the vocal glissando and the violin glissando will lean towards just intonation because pitches in the overtone series of the string vibrating will be the most resonant.

Glissando Exercises are very useful for physically training the voice. In order to reap the physical benefits of these exercises attention should be given to the smoothness of the vocal glissando. However, the primary purpose of this series of exercises is to train the ear; both to be more sensitive to the resonance of the violin, and to develop the ability to audiate for the violin and the voice at the same time.

Glissando Exercise - Variation 1

1. In a single bow stroke, glissando from an open string to the next chromatic pitch up. For example, from the open G string, glissando to Ab₃ using only the first finger. There should be a clear point of departure and a clear point of arrival. Approximately 1/4 of the bow should be spent on G₃, 1/2 of the bow on the glissando, and 1/4 of the bow on Ab₃.
2. Change the bow direction, and glissando from Ab₃ to G₃.
3. Repeat this for every chromatic note of the scale: A₃, Bb₃, B₃, C₄ etcetera all the way up to G₄.
4. Repeat the entire exercise on all of the open strings.

Listen to an example on the G string:

<https://soundcloud.com/cassienorton/violin-glissando-with-reference-to-an-open-string-g>

Glissando Exercise - Variation 2

1. Start with the body turned slightly to the left, and balance on the left foot. In one bow stroke, play G₃ while singing a glissando from G₃ to Ab₃. As the pitch becomes higher begin to shift the body's weight to the right. In this exercise the pitch for the voice is imagined on a horizontal plain: left is low, right is high. Just as in variation 1 there should be a clear point of departure and arrival. Approximately 1/4 of the time spent on G₃, 1/2 spent on the glissando, and the last 1/4 spent on Ab₃.
2. Change the bow direction while taking a breath, and continue to play G₃ on the violin. While moving the body weight back to the left, sing a glissando from Ab₃ to G₃.

3. Repeat this for every chromatic note of the scale: A3, Bb3, B3, C4 etcetera all the way up to G4. Each interval in the chromatic scale should correspond to a wider movement with the body, so that by G4 the body weight is fully on the right foot.

4. Repeat the entire exercise on the D, A, and E strings. On the A and E strings start the voice an octave lower than the violin.

Listen to an example on the G string:

<https://soundcloud.com/cassienorton/vocal-glissando-with-an-open-string-violin-drone-g>

Glissando Exercise - Variation 3

1. Begin with a bow stroke on G3 and sing in unison with the open string. Try to match the sound of the open string. Change the vowel sound if necessary. Glissando with the first finger to G4 while continuing to sing G3. Try to keep the voice as steady as possible to support an awareness of the changing intervals between the violin and the voice.

2. Take a breath while changing the bow, and continue to sing G3 while sliding back down from G4 to G3 with the bow.

3. Repeat this for every note in the descending chromatic scale: Gb4, F4, E4, Eb4 etcetera.

4. Repeat the entire exercise on the D, A and E strings. The vocal drone for the E string may be sung an octave lower, depending on the vocal range that day.

Listen to an example on the D string:

<https://soundcloud.com/cassienorton/violin-glissando-with-a-vocal-drone-d>

Glissando Exercise - Variation 4

Variation 4 combines variation 2 with variation 1. Both the violin and the voice glissando in unison. The body movements described in variation 2 are used in variation 4 because they are connected to pitch in the voice. Repeat the entire exercise on the D, A and E strings. For the A and E strings the voice will sing an octave lower than the violin.

Listen to an example on the D string:

<https://soundcloud.com/cassienorton/violin-vocal-glissando-with-reference-to-the-open-d-string>

Chapter Four: Rhythmic Exercises

4.1 Acceleration/Deceleration Exercises

These exercises are not specific to violin and voice. They can be performed by either two people or one person capable of playing two rhythmically independent melodic lines. For this reason, the two voices in these exercises are labelled voice 1 and 2 rather than violin and voice. The use of voice 1 and 2 instead of violin and voice in the annotation of the exercises reinforces the idea that each part can be played with any two instruments.

The goal of all of the *Acceleration/Deceleration Exercises* (outlined below) is to strengthen a sense of internal pulse, as well as to develop a strong relationship between subdivision and pulse on the violin and in the voice.

The basic exercise in this series draws attention to the way in which different *subdivisions*³⁴ play out through an ascending and descending heptatonic scale over four *pulses*³⁵. Cycles of four pulses are common in all types of music, and so a four beat cycle is a familiar starting point for any trained musician. Changing between binary and ternary subdivisions within the same piece is less common (especially in Western music). The less familiar aspect of the exercise - the subdivision changes - is stabilized by the more familiar limitation of four pulses per *set*³⁶.

Variation 1 uses subdivisions of pulse in ascending and descending heptatonic scales to imply specific harmonies. The intervallic structure of voice 1 is determined by the number of subdivisions between one pulse and the next in voice 2. The relationship between intervals and pulse in this exercise is logical

34 Subdivisions are defined as identical, measured divisions of time within one pulse. All of the exercises in chapter 4, particularly in sections 4.1 and 4.2 rely on the ability to internalize subdivisions. Please see appendix C for an approach to internalizing subdivisions which can be applied to most of the exercises in chapter 4.

35 *Pulse* is defined as a measured duration of even time. Pulse and beat are words which are used interchangeably in music. However, beat is used more often than pulse, and therefore has more associations eg. time signature which may or may not relate to the exercises in this paper. For this reason, the word pulse is preferred over beat in this paper.

36 A new "set" is defined by a change in subdivisions per pulse.

enough to be understood, internalized and eventually used in the context of improvisation. The aim of variation 1 is to strengthen and build on connections between rhythm, melody and harmony in the violin and the voice.

In Variation 2 the intervallic structure of voice 1 is again determined by the number of subdivisions per pulse in voice 2. The more subdivisions per pulse, the closer the intervals become in a set; closer in time equals closer in pitch. This is an easy relationship to visualize and to understand intuitively. The relationship between subdivisions per pulse and intervals per pitch-set is constant throughout exercise. This creates stability, making the changes easier to move through.

For each of the variations voice 1 and 2 are to be practiced on both violin and voice. The articulations can be somewhat generalized for all of the exercises in the set. A variety of staccato and sustained articulations can be experimented with as long as there is always a clear point of attack. For example, the violin could use pizzicato, or any form of detached bow stroke. Similarly, the voice could articulate each note with a "ya" or "da" sound. True staccatos are harder to articulate at higher speeds in the voice. Alternatively, pulses on the violin could be defined by a change in bow-stroke or an articulation mid-bow-stroke. Similarly, in the voice, pulses could be marked with a consonant, and the subdivisions could be sung legato. Staccato articulations will encourage the practitioner to focus on individual notes, making the subdivisions more even, whereas legato articulations will encourage the practitioner to focus on the pulse, making the phrasing more fluid.

Acceleration/Deceleration Exercise - Basic

Before starting this exercise some parameters must be established. A heptatonic scale, as well as a slow tempo (between 40 and 60 bpm) must be chosen. Initially a metronome should be used to mark the pulse. Although this is an exercise with variables that should be improvised it is best explained through example. Please see a possible realization of the exercise in G Lydian (*figure 4.1*) before reading the description.

Acceleration/Deceleration Exercise - Basic

The musical score is titled "Acceleration/Deceleration Exercise - Basic" and is written in G Lydian mode (one sharp, F#). It consists of seven sets, each with two staves labeled "voice 1" and "voice 2". The exercises are as follows:

- set 1:** Voice 1 has a half note G4, A4, B4, C5. Voice 2 has a half note G4, A4, B4, C5. The instruction "switch parts on repeat" is at the end.
- set 2:** Voice 1 has a half note G4, A4, B4, C5. Voice 2 has a half note G4, A4, B4, C5. The instruction "switch parts on repeat" is at the end.
- set 3:** Voice 1 has a half note G4, A4, B4, C5. Voice 2 has a half note G4, A4, B4, C5. The instruction "switch parts on repeat" is at the end.
- set 4:** Voice 1 has a half note G4, A4, B4, C5. Voice 2 has a half note G4, A4, B4, C5. The instruction "switch parts on repeat" is at the end.
- set 5:** Voice 1 has a half note G4, A4, B4, C5. Voice 2 has a half note G4, A4, B4, C5. The instruction "switch parts on repeat" is at the end.
- set 6:** Voice 1 has a half note G4, A4, B4, C5. Voice 2 has a half note G4, A4, B4, C5. The instruction "switch parts on repeat" is at the end.
- set 7:** Voice 1 has a half note G4, A4, B4, C5. Voice 2 has a half note G4, A4, B4, C5. The instruction "switch parts on repeat" is at the end.

Figure 4.1 - Realization Acceleration/Deceleration Exercise in G Lydian

The general instructions that can be drawn from this example are as follows. Each set is eight pulses long. The pulse remains constant and the subdivisions per pulse increase by one for each *set*³⁷; starting at two *subdivisions*³⁸ per pulse for set one, and increasing to eight subdivisions per pulse for set seven, and then decreasing back down to two subdivisions per pulse for the last set. Voice 1 intones the pulse on the tonic of the chosen scale for the entire exercise. For the first five sets voice 2 intones the subdivisions on ascending scale degrees for pulses one and two, and on descending scale degrees for pulses three and four of each set. In sets six and seven voice 2 intones subdivisions on ascending scale degrees for the first pulse, on descending scale degrees for the second pulse, and repeats the pattern on the third and fourth pulses. The truncating of the scalar pattern in sets six and seven keep the exercise within the range of an octave and a sixth, making it singable in a number of different keys. The four pulses of rest in voice 2 in all of the sets are also included to give the voice a rest. It is difficult to articulate fast subdivisions accurately without space for breath.

Although this exercise is most clearly explained through music notation, it is important to understand that it has many possible realizations. Figure 4.2 shows a generalized outline of the exercise that can be applied to any heptatonic scale.

set number	subdivisions per pulse	Voice 1 scale degrees	Voice 2 (scale degrees and compound intervals ³⁹)
1	2	1-1-1-1-1-1-1-1	1-2-3-4-5-4-3-2-1
2	3	1-1-1-1-1-1-1-1	1-2-3-4-5-6-7-6-5-4-3-2-1
3	4	1-1-1-1-1-1-1-1	1-2-3-4-5-6-7-8-9-8-7-6-5-4-3-2-1
4	5	1-1-1-1-1-1-1-1	1-2-3-4-5-6-7-8-9-10-11-10-9-8-7-6-5-4-3-2-1
5	6	1-1-1-1-1-1-1-1	1-2-3-4-5-6-7-8-9-10-11-12-13-12-11-10-9-8-7-6-5-4-3-2-1
6	7	1-1-1-1-1-1-1-1	1-2-3-4-5-6-7-8-7-6-5-4-3-2-1 (x2)
7	8	1-1-1-1-1-1-1-1	1-2-3-4-5-6-7-8-9-8-7-6-5-4-3-2-1 (x2)

Figure 4.2 - Generalized Outline of Acceleration/Deceleration Exercise - Basic

37 A new "set" is defined by a change in subdivisions per pulse.

38 Subdivisions are defined as identical, measured divisions of time within one pulse. All of the exercises in chapter 4, particularly in sections 4.1 and 4.2 rely on the ability to internalize subdivisions. Please see appendix C for an approach to internalizing subdivisions which can be applied to most of the exercises in chapter 4.

39 A compound interval is an interval greater than an octave. Compound intervals are identified with numbers. The smallest compound interval is a 9th, which is an 8ve + a 2nd. By the same logic a 10th is an 8ve + a 3rd, an 11th is an 8ve + a 4th and so on.

Initially, when practicing this exercise voice 1, and then voice 2 should be played in unison; and then played as written. This will result in each set being played four times. In order to create a feeling of acceleration and deceleration through subdivisions changes, the entire exercise should be practiced in order, from two subdivisions per pulse, to eight subdivisions per pulse, and back down to two subdivisions per pulse.

Acceleration/Deceleration Exercise - Variation 1

Variation 1 requires similar parameters to be set as in the basic exercise. Again a heptatonic scale and a slow pulse between 40 and 60 bpm must be chosen. Just as with the basic exercise, variation 1 is best explained through example. Please see a possible realization of the exercise in G Lydian (*figure 4.3*) before reading the description.

Acceleration/Deceleration Exercise - Variation 1

The musical score consists of seven sets, each with two staves. The key signature is one sharp (F#) and the time signature is 4/4. Each set includes a first staff (Voice 1) and a second staff (Voice 2). The exercises are as follows:

- set 1:** Voice 1: [descending 6ths], [ascending 6ths]; Voice 2: [descending 6ths], [ascending 6ths]. Includes the instruction "switch parts on repeat".
- set 2:** Voice 1: [descending 5ths], [ascending 5ths]; Voice 2: [descending 5ths], [ascending 5ths]. Includes the instruction "switch parts on repeat".
- set 3:** Voice 1: [descending 4ths], [ascending 4ths]; Voice 2: [descending 4ths], [ascending 4ths]. Includes the instruction "switch parts on repeat".
- set 4:** Voice 1: [descending 3rds], [ascending 3rds]; Voice 2: [descending 3rds], [ascending 3rds]. Includes the instruction "switch parts on repeat".
- set 5:** Voice 1: [descending 2nds], [ascending 2nds]; Voice 2: [descending 2nds], [ascending 2nds]. Includes the instruction "switch parts on repeat".
- set 6:** Voice 1: [alternating octaves]; Voice 2: [alternating octaves]. Includes the instruction "switch parts on repeat".
- set 7:** Voice 1: [descending 7ths], [ascending 7ths], [descending 7ths], [ascending 7ths]; Voice 2: [descending 7ths], [ascending 7ths], [descending 7ths], [ascending 7ths]. Includes the instruction "switch parts on repeat".

Figure 4.3 - Acceleration/Deceleration Exercise - Variation 1

As in the basic exercise voice 1 marks the pulse and voice 2 subdivides the pulse. Again, similar to the basic exercise, voice 2 ascends and descends through the chosen scale, starting on the tonic. The biggest difference between the basic exercise and variation 1 is that voice 1 is no longer static in terms of pitch, but moves in relationship to voice 2. Another difference between the basic exercise and variation 1 is that the number of pulses per set are not constant. The length of a set in variation 1 is determined by how many pulses it takes voice 2 to ascend through the octave. In the first set this takes four pulses, so four more pulses are added for the descending passage, and four more for measure of rest (a total of twelve pulses). In the second set it takes three pulses, so three more pulses are added for the descending passage, and three more for the measure of rest (a total of nine pulses).

The duration of sets six and seven are modelled after the basic exercise. The melody for voice 1 is determined by the melodic intervals between pulses in voice 2. The first set yields ascending thirds for the first four pulses and descending thirds for the next four pulses. The second set yields ascending fourths for the first three pulses, and descending thirds for the next three pulses. The third set yields ascending fifths for the first two pulses and descending fifths for the next two pulses. To make the harmonic motion between voice 1 and voice 2 more interesting, voice 1 always starts a third above voice 2 and moves in contrary motion, where possible, to voice 2. Intervals can be inverted to create contrary motion and/or to make the exercise more singable. Voice 1 continues the intervallic pattern for one pulse after the subdivisions stop in voice 2, and then intones the tonic for the remaining pulse/pulses in the set. Just as with the basic exercise, there are many possible realizations of variation 1. *Figure 4.4* shows a generalized outline of variation 1 from which other realizations can be constructed.

		Voice 2 ascending		Voice 2 descending	
set number	subdivisions per pulse	Voice 1 (intervals)	Voice 2 (scale degrees and compound intervals)	Voice 1 (intervals)	Voice 2 (scale degrees and compound intervals)
1	2	descending 6ths	1-2-3-4-5-6-7-8-9	ascending 6ths	8-7-6-5-4-3-2-1
2	3	descending 5ths	1-2-3-4-5-6-7-8-9-10	ascending 5ths	9-8-7-6-5-4-3-2-1
3	4	descending 4ths	1-2-3-4-5-6-7-8-9-8	ascending 4ths	7-6-5-4-3-2-1
4	5	descending 3rds	1-2-3-4-5-6-7-8-9-10-11	ascending 3rds	10-9-8-7-6-5-4-3-2-1
5	6	descending 2nds	1-2-3-4-5-6-7-8-9-10-11-12-13	ascending 2nds	12-11-10-9-8-7-6-5-4-3-2-1
6	7	unison or octaves	1-2-3-4-5-6-7-8	unison or octaves	7-6-5-4-3-2-1
7	8	descending 7ths	1-2-3-4-5-6-7-8-9	ascending 7ths	8-7-6-5-4-3-2-1

Figure 4.4 - Generalized outline of the Acceleration/Deceleration Exercise - Variation 1

Variation 1 should be practiced in a similar way to the basic exercise. Voice 1, and then voice 2, should be played in unison, and then as written, switching on the repeat. The entire exercise should be practiced in order, from two subdivisions per pulse, to eight subdivisions per pulse, and back down to two subdivisions per pulse.

Acceleration/Deceleration Exercise - Variation 2

For variation 2 similar parameters must be set as were set in the basic exercise and in variation 1. A slow tempo and pitch-set must be chosen. Again, this variation is better explained through example than through description alone. Please see *figure 4.5* for an example in G Mixolydian.

Acceleration/Deceleration Exercise - Variation 2 - Realization 1

The musical score consists of eight systems, each labeled in the top left corner: set 1, set 2, set 3, set 4, set 5, set 6, set 7a), and set 7b). Each system contains two staves. The top staff of each system is labeled 'voice 1' and the bottom staff is labeled 'voice 2'. The key signature is one sharp (F#) and the time signature is 3/8. The notation shows a progression of rhythmic patterns across the staves. In each system, the top staff (voice 1) typically contains a single note or a short phrase, while the bottom staff (voice 2) contains a more complex rhythmic pattern. The patterns in the bottom staff become increasingly complex and faster from set 1 to set 7b). The instruction 'switch parts on repeat' is written at the end of each system. The notation includes various note values (quarter, eighth, sixteenth notes), rests, and slurs. Some systems (set 2, 4, 5, 6, 7a, 7b) include fingerings (3, 5, 6, 7) for the bottom staff.

Figure 4.5 - Acceleration/Deceleration Exercise - Variation 2 - Realization 1

Just as in the basic exercise, voice 1 is unchanging rhythmically and melodically, whereas voice 2 changes in relation to the subdivisions with every set. The biggest difference between variation 2 and both the basic exercise and variation 1 is the way the melody of voice 2 is constructed. In variation 2 the number of subdivisions per pulse correspond to the number of pitches in use, and the completion of one pulse corresponds to a change in melodic direction. As subdivisions are added to the pulse, pitches are also added to the set in use, and a pre-determined pitch-set is realized.

There are many possible realizations of this exercise because there are many ways to construct and interpret pitch-sets. One of the more compelling realizations of this exercise creates a parallel relationship between a pulse and an octave. In this case the pitch-set chosen must be an *octatonic*⁴⁰ scale to accommodate the eight subdivisions per pulse in the final pattern. The beauty of the octatonic scale in relation to this exercise, is that the completion of an octave will always correspond with the completion of a pulse. The octave is the easiest interval to perceive intuitively, because the higher note in the interval is the first overtone of the lower note⁴¹. Most common practice scale patterns fall into the space between two tones an octave apart (Hindemith, 37). Similarly, pulse creates a framework for rhythmic phrasing, by providing a stable unit of time, in which to play out its patterns. Consequently, pairing pulse with recurring octaves contributes to stability in the performance of the exercise.

However, there are reasons why an octatonic version of this exercise does not easily lend itself to the combination of violin and voice⁴². Although the relationship between pulse and octave in this exercise make any octatonic scale a good choice, it is also worth experimenting with heptatonic scales, for the sake of playability. In *figure 4.5*, a realization in G Mixolydian, there are two versions of set 7: the first,

40 The octatonic scale is simply an eight note scale (not to be mistaken for half-whole tone scale or whole-half tone scale, the most common octatonic scale).

41 The lower note in an octave is the first overtone, and also the fundamental.

42 The octatonic version of this exercise is more awkward with violin and voice for two reasons. The first is a simple physical one. Heptatonic scales are very natural on the violin because an octave can be framed in the hand, falling between the first (index) finger on one string and the fourth (pinky) on the adjacent higher string. Each of the eight fingers (four on each string) in use can be assigned to one note, including the octave. Because this is a rhythmic exercise it is possible to perform it more accurately if all notes are given equal physical attention. This is much more difficult if two notes on one string are assigned to the same finger. As well, octatonic scales are much less common in the Western canon than heptatonic scales, and consequently more difficult to hear and to sing. A compromise which will allow the exercise to stay within the octave while at the same time retaining a familiar melodic structure for a western performer/listener is to use a heptatonic scale with a b7 as the parent melody, and then, on the set with eight subdivisions per pulse add a leading tone (scale degree 7). This compromise is illustrated in set 7 of the first realization of variation 2 (*fig 4.5*).

(7a) stays within the octave by adding the major seventh between the flat seventh and the octave; and the second, (7b) goes up to the ninth.

The logic governing the order in which the intervals are added in *fig. 4.5* (realization 1) relies on familiar melodic structures as guide posts. The first guide post is the major triad in set 2, the second guide post is the pentatonic scale in set 4, and the final guide post is the major scale in set six. Despite this logic being attached to specific intervallic structures, the quality of the scale degrees can and should be changed in subsequent practices. The relationship between the intervallic structures will remain intact and can serve as points of reference even if the intervals themselves aren't the same. *Fig. 4.6* shows a realization based on G aeolian which uses the same order for the addition of scale degrees, and a similar logic for the extra subdivision in sets 7a and 7b.

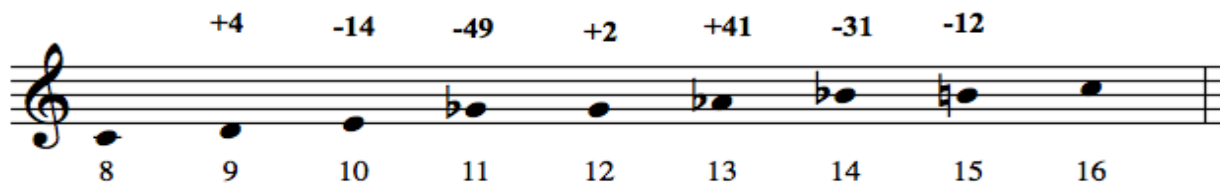
Acceleration/Deceleration Exercise Variation 2 - Realization 2

The musical score consists of eight systems, each representing a different set of the exercise. Each system is written for two voices, voice 1 and voice 2, in a 2/2 time signature with a key signature of one flat (B-flat). The notation includes various rhythmic patterns and melodic lines. The sets are labeled as follows:

- set 1:** voice 1 and voice 2. The first measure of voice 2 is marked with a '3' (triple). The instruction "switch parts on repeat" is present.
- set 2:** voice 1 and voice 2. The first measure of voice 2 is marked with a '3' (triple). The instruction "switch parts on repeat" is present.
- set 3:** voice 1 and voice 2. The first measure of voice 2 is marked with a '3' (triple). The instruction "switch parts on repeat" is present.
- set 4:** voice 1 and voice 2. The first measure of voice 2 is marked with a '5' (quintuplet). The instruction "switch parts on repeat" is present.
- set 5:** voice 1 and voice 2. The first measure of voice 2 is marked with a '6' (sextuplet). The instruction "switch parts on repeat" is present.
- set 6:** voice 1 and voice 2. The first measure of voice 2 is marked with a '7' (septuplet). The instruction "switch parts on repeat" is present.
- set 7a):** voice 1 and voice 2. The first measure of voice 2 is marked with a '7' (septuplet). The instruction "switch parts on repeat" is present.
- set 7a):** voice 1 and voice 2. The first measure of voice 2 is marked with a '7' (septuplet). The instruction "switch parts on repeat" is present.

Figure 4.6 - Acceleration/Deceleration Exercise - Variation 2 - Realization 2

Another way of realizing this exercise is to base the chosen scale directly on the overtone series. Partial eight to sixteen, four octaves above the fundamental, form an octatonic scale (*fig. 4.7*).



The plus and minus signs indicate the number of cents⁴³, sharp or flat, that the pitches deviate from equal temperament.

Figure 4.7 - Octatonic Scale from 8-16 of the Overtone Series⁴⁴

For the relationship between the overtone series and this scale to be meaningful it would have to be performed in just intonation in relation to its fundamental. For intervals that are low in the overtone series string players tend to adjust their tuning towards just intonation. The scale in *fig. 4.7* is derived from overtones relatively high in the overtone series. It is not reasonable to propose that this octatonic scale will be performed in just intonation without a good deal of practice. It is meaningful, however, to experiment intentionally with different interpretations of the overtone series to see how far the perception of resonance can be used as a guide. The third realization of Variation 2 of the Acceleration/Deceleration exercise (*fig. 4.8*) is one such experiment.

⁴³ "Cents" are a logarithmic measure for musical intervals. Twelve-tone equal temperament divides the octave into twelve semi-tones of 100 cents each.

⁴⁴ The scale in figure 4.7, and modifications of it, were used by trumpet players up until Bach's time (Hindemith, 18).

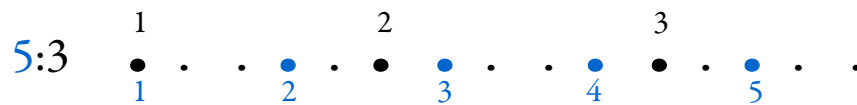
Acceleration/Deceleration Exercise - Variation 2 - Realization 3

The musical score consists of seven systems, each labeled 'set 1' through 'set 7' in a small box at the beginning of the first staff. Each system contains two staves: the top staff is for 'voice 1' and the bottom staff is for 'voice 2'. The key signature is one sharp (F#) and the time signature is 3/8. The notation for voice 1 is simple, consisting of quarter notes. The notation for voice 2 includes various rhythmic patterns: Set 1 has quarter notes; Set 2 has eighth notes with triplet markings; Set 3 has eighth notes; Set 4 has eighth notes with quintuplet markings; Set 5 has eighth notes with sextuplet markings; Set 6 has eighth notes with septuplet markings; and Set 7 has eighth notes. Each system concludes with a double bar line and the instruction 'switch parts on repeat' written in italics on the right side of the second staff.

Figure 4.8 - Acceleration/Deceleration Exercise - Variation 2 - Realization 3

4.2 Polypulse Exercises

A polypulse⁴⁵ is the combination of two pulses of different speeds played within the same time frame. For example: a cycle of five pulses played in the same time frame as a cycle of three pulses. A good way to perform a polypulse accurately is to subdivide one of the pulses in relation to the other. For example, three pulses subdivided by five subdivisions gives a total of fifteen subdivisions. We then divide those fifteen subdivisions by three, and get five pulses inside the three pulses or five pulses in the time of three pulses (5:3). A visual illustration of this polypulse is shown in *fig. 4.9*.



The black dot at the beginning represents the point in the cycle when two pulse groups are in unison. The other large black dots represent the group of three pulses, the medium blue dots represent the group of five pulses, and the small dots represent the shared subdivisions that don't fall on a pulse⁴⁶.

Figure 4.9 - Illustration of the Polypulse 5:3

If, instead of taking the three pulses and subdividing them by five, we took the five pulses and subdivide them by three we would get the polypulse 3:5, illustrated in *figure 4.10*.

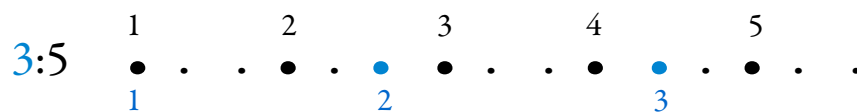


Figure 4.10 - Illustration of the Polypulse 3:5

The only difference between the polypulse 3:5 and the polypulse 5:3 is in how they are perceived. This however, is significant, because how a polypulse is perceived affects how it fits into a larger musical context, and to some extent, how it is performed. Imagining a polypulse as 5:3 would be most suitable in

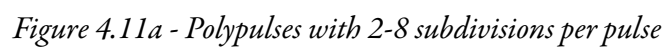
⁴⁵ "Polypulse" is a term used by Miles Okasaki (Okasaki, 124) to describe two pulses of different speeds played within the same time frame. "Polyrhythm" is a more common term often used to describe the same thing. Polypulse was chosen because "poly" means more than one, and "pulse" means an even subdivision of time. Polyrhythm is a term that often leads to confusion because the word "rhythm" means many things. Polypulse is therefore a less ambiguous term.

⁴⁶ This approach to illustrating polypulse was adapted from Trichy Sankaran's "The Art of Konnakol" and Miles Okasaki's "Fundamentals of Guitar."

the context of a 3-pulse meter because three pulses are being subdivided by five, whereas imagining a polypulse as 5:3 would be most suitable in the context of a 5-pulse meter because five pulses are being subdivided by three.

The stability of any polypulse relies on a stable relationship between the first pulse being subdivided and its subdivisions. As long as this relationship is stable then the same subdivisions can be regrouped to form any second pulse without too much extra thought. For example: if a polypulse is perceived as 5:3 then 5:2, 5:4, 5:6, 5:7 and 5:8 can be easily transitioned to if the five subdivisions per pulse (associated with the three pulse cycle) are stable. Similarly, if the same polypulse is perceived as 3:5 then 3:2, 3:4, 3:7, and 3:8 can be transitioned to if the three subdivision per pulse (associated with the five pulse cycle) are stable. The polypulses presented in *figure 4.11a and 4.11b* are organized according to like subdivisions (as described above) in order to facilitate ease of performance. The black dots represent the first subdivided pulse and its subdivisions, and the blue dots represent the second pulse which is added in relation to the first. *Figure 4.11a,b* uses the same visual analogy to illustrate polypulse as is used in *figures 4.9 and 4.10*, only without numbers indicating the duration of each of the pulse cycles. All of the polypulses presented in *figure 4.11a,b* can be created from combinations of two pulses with two to eight subdivisions per pulse. These polypulses form the basis for all of the polypulse exercises in this chapter.

Presenting polypulses as they are shown in *figure 4.9, 4.10 and 4.11a,b* provides a more direct visual understanding of the way polypulses work than is provided with Western music notation. The author has found that this translates into a clearer visualization in the brain, and a more accurate performance. The numbers in *figures 4.9 and 4.10* were provided as a bridge to understanding the visual analogy. The author has found that, for her personally, attaching any sort of symbol to the dots (numbers, syllables, letters) make the illustrations less effective as visual aides for practice. However, one should be reminded, that it is extremely helpful to have a comprehensive system for internalizing subdivisions, when working on challenging rhythms. Please see *Appendix C: Approaches to Internalizing Subdivisions* for more details on this topic.



The primary purpose of the *Polypulse Exercises* is to develop and strengthen one's ability to use the internal subdivisions of a pulse to understand and perform rhythms accurately with the violin and the voice. Proficiency in these exercises will not only help with performing polypulses, it will also help with hearing, inventing, and performing rhythmic phrases which move through different subdivision changes. The *Polypulse Exercises* and the *Acceleration/Deceleration Exercises* both approach rhythm through pulse and subdivision, but the focus is placed differently. Understanding and refining one set of exercises will help with understanding and refinement of the other set. In the *Acceleration/Deceleration Exercises* the practitioner moves through a series of changing subdivisions while maintaining a constant pulse, whereas in the *Polypulse Exercises* the practitioner moves through a series of changing pulses, while maintaining constant subdivisions. Subdivisions can only be played accurately if the pulse is internalized. In the same way, polypulses are only played accurately if their shared subdivisions are internalized.

When moving between like subdivisions in the *Polypulse Exercise* both the subdivisions and the pulse from the constant pulse group are kept the same; but when moving from one subdivision group to the next, only the constant pulse is kept the same. The later situation is much more difficult than the former, because only one part of the rhythm is stable. The polypulses in *figure 4.11* were grouped according to like subdivisions intentionally to separate the mental work required for the *Acceleration/Deceleration Exercise* from the mental work required for the *Polypulse Exercises*. A more advanced version of the *Polypulse Exercise* would use the constant pulse as the only point of stability and continuously move between polypulses based on different subdivision groups. This kind of exercise would be a combination of the *Acceleration/Deceleration Exercises* and the *Polypulse Exercises*.

Polypulse Exercise - Basic

At the beginning of this exercise a few parameters must be set, a slow tempo (between 40-60bpm) and pitch-set should be chosen. The pitch-set must be both easy to play physically on the violin and easy to sing. Any heptatonic scale is a good choice initially.

1. Begin with the first polypulse in *fig. 4.6* (2:7). With the index finger of the bow hand, pluck one of the open strings in time with the metronome (the constant pulse). At the same time use the middle finger on

a different string to pluck the first two notes of the pitch-set in time with the changing pulse. In order to stabilize the polypulse, count the subdivisions internally. Repeat the first cycle until it is stable.

2. Once the polypulse is stable⁴⁷ sing in unison with the changing pulse.

3. Start with a group of like subdivisions (for example 2:7, 2:5, 2:3), and move through the changing pulses: first, in the order they are written, then in the opposite order, and then randomly. Once a group of like subdivisions is stable⁴⁸, continue onto the next group⁴⁹. When switching between subdivision groups, the pulse should remain stable.

Polypulse Exercise - Variation 1

Before starting variation 1, a slow tempo (40-60bpm) and a heptatonic scale must be chosen. The melody played in time with the changing pulse is the chosen scale ascending from the tonic with no skips. The number of scale degrees used is determined by the number of changing pulses in the cycle. The melody to be played in time with the constant pulse is derived from the scale in the following manner: for subdivisions of two, play scale degrees one and five, for subdivisions of three and four, ascend in thirds, for subdivisions of five and more ascend and then descend in thirds, landing on either the third or the fifth, but not the tonic.

Instructions for Practice of Variation 1:

1. Start with steps 1 and 2 from the basic version of the *Polypulse Exercise*.
2. Once the polypulse is stable stop plucking with the changing pulse, but continue singing with the changing pulse and plucking with the constant pulse.
3. Once the polypulse is stable between the voice and the violin, add melodic motion in the manner described above to the constant pulse.
4. Move through the polypulses in a similar manner to step three of the basic exercise.⁵⁰

Figure 4.12a,b is an example of variation 1 in D Aeolian.

⁴⁷ If the subdivisions are not internalized, singing the changing pulse will destabilize the polypulse. For assistance with internalizing subdivisions, please see appendix C.

⁴⁸ The performance of a polypulse is stable when the subdivisions underlying the two pulses require very little conscious attention, allowing the performer to be aware of both pulses at the same time.

⁴⁹ Initially, it will probably not be possible to practice all of the polypulses in *figure 4.11* in one session. One or two subdivision groups could be selected for each practice session until the entire set is stable.

⁵⁰ Once the basic exercise is mastered, steps 1 and 2 from variation 1 can be eliminated.

Polypulse Exercise - Variation 1

The musical score for "Polypulse Exercise - Variation 1" consists of five systems of two staves each. The top staff of each system is labeled "Changing Pulse" and the bottom staff is labeled "Constant Pulse". The exercise is divided into measures by vertical bar lines, with some measures containing triplets indicated by a '3' over a bracket.

System 1:

- Changing Pulse: Measures 1-3 with ratios 2:7, 2:5, and 2:3.
- Constant Pulse: Measures 1-3 with ratio 4:7.

System 2:

- Changing Pulse: Measures 4-6 with ratios 8:7, 8:5, and 8:3.
- Constant Pulse: Measures 4-6 with ratios 4:5 and 4:3.

System 3:

- Changing Pulse: Measures 7-9 with ratios 8:3 and 3:8.
- Constant Pulse: Measures 7-9 with ratio 3:7.

System 4:

- Changing Pulse: Measures 10-12 with ratios 3:5, 3:4, and 3:2.
- Constant Pulse: Measures 10-12 with ratio 3:7.

System 5:

- Changing Pulse: Measures 13-15 with ratios 3:5, 3:4, and 3:2.
- Constant Pulse: Measures 13-15 with ratio 3:7.

Figure 4.12a - Polypulse Exercise - Variation 1

The musical score consists of six systems, each with a treble and bass staff. The exercises are as follows:

- System 1:** Treble staff has sixteenth-note runs with fingerings 6-6-6-6-6-6. Bass staff has a simple eighth-note accompaniment. Ratios 6:7 and 6:5 are indicated.
- System 2:** Treble staff has sixteenth-note runs with fingerings 5-5-5-5-5-5. Bass staff has a simple eighth-note accompaniment. Ratios 5:8, 5:7, and 5:6 are indicated.
- System 3:** Treble staff has sixteenth-note runs with fingerings 5-5-5-5-5-5. Bass staff has a simple eighth-note accompaniment. Ratios 5:4, 5:3, and 5:2 are indicated.
- System 4:** Treble staff has sixteenth-note runs with fingerings 7-7-7-7-7-7. Bass staff has a simple eighth-note accompaniment. Ratios 7:8 and 7:6 are indicated.
- System 5:** Treble staff has sixteenth-note runs with fingerings 7-7-7-7-7-7. Bass staff has a simple eighth-note accompaniment. Ratios 7:5 and 7:4 are indicated.
- System 6:** Treble staff has sixteenth-note runs with fingerings 7-7-7-7-7-7. Bass staff has a simple eighth-note accompaniment. Ratios 7:3 and 7:2 are indicated.

Figure 4.12b - Polypulse Exercise - Variation 1 (cont.)

4.3 Accompaniment Figures articulated on the Violin

In music, accompaniment can be defined as a supportive role taken by a single musician or ensemble playing with a lead musician. For practical reasons, this section will address a specific type of accompaniment that is rhythmically repetitive in nature and outlines both the rhythmic and harmonic structure of a piece or improvisation.⁵¹ This type of accompaniment provides stability and contrast for a lead melody and is arguably the most common form of accompaniment. Music that conforms to these criteria include: Piano accompaniment to vocal, and solo instrumental pieces in Western classical and contemporary music, comping in jazz, the Orchestra in a Concerto, accompaniment figures within a solo piano piece, and guitar accompaniment to voice in a rock or folk context. This type of accompaniment usually comprises repetitive rhythmic figures which outline the harmony of a piece. To construct an effective accompaniment of this nature, one must consider *voicing*⁵², *voice leading*⁵³, and *articulations*⁵⁴ specific to the instrument it is being performed on. On the violin, notes played with string crossings and notes played on the same string make different articulations possible. Therefore, string crossings must be considered when voicing and voice leading rhythmic accompaniment figures. Articulation affects rhythm at the level of a single note. The most basic example of this is the difference between staccato (short duration notes) and legato (full duration notes). Even though the duration of a rhythmic phrase is not affected by articulation, individual notes are, and although this may not affect the way note values are written it does affect how a rhythm is played. The violin is capable of many types of articulation because the bow controls the shape of individual notes from beginning to end. For this reason, articulation is a very important consideration when creating rhythmic figures for accompaniment on the violin. This section presents a variety of rhythmic figures, which are effective as accompaniment textures, and through the addition of voicing constraints and articulations, they are made suitable for performance on the violin. In order to illustrate how these rhythmic figures are voiced and articulated on

51 Although there are other interesting ways to provide accompaniment, this definition is both the most common, and most easily addressed through exercises.

52 Voicing is defined here as the order and spacing of pitches arranged vertically to form chords.

53 Voice leading is the way in which single musical lines (voices) move together to achieve melodic harmonic and rhythmic goals, while considering a variety of harmonic and melodic parameters. Some examples include common tones between adjacent chords, use of leaps and/or steps, crossing of voices, resolutions of dissonances, and parallel or contrary motion between voices.

54 Articulation in music refers to the way an individual note or sound is played, or the transition between a group of notes or sounds. For more information on articulation specific to the violin please see appendix B.

the violin, they have been set to specific pitches in *figure 4.13*.

1) (ds2)
arco

2) (ds2)

3) (ds2)
pull

4) (ds2)
col legno battuto let bounce sim.

5a) (ds2)

5b) (ds3)

6a) (ds2)

6b) (ds3)

7a) (ds2)

7b) (ds3)

8a) Rolling (arp4)

8b) Rolling (arp3)

9) (ds3)

10) (ds2)

11a) (ds2)

11b) (ds2)
pull

Figure 4.13a - Accompaniment Figures Articulated on the Violin

21 12a) (ds3) 12b) (ds2)

23 13a) (ds2) 13b) (ds3)

25 14) (ds2)

27 15a) (ds2) 15b) (ds3)

29 16a) (ds2) 16b) (ds3)

31 17) (ds2)

33 18a) (ds2) 18b) (ds3)

35 19. ds2 no voicing constraint ds2 ds2 no voicing constraint ds2

pizz. 20a) 20b)

37 pizz. same string arp2 same string arp3 same string

39 21a) 21b) same string

pizz. arp2 same string arp3

Figure 4.13b - Accompaniment Figures Articulated on the Violin (cont.)

These figures can initially be practiced as written, and then transposed into different keys, played with different harmonic progressions, and eventually used for song writing and/or improvisation. In *figure 4.13*, voicing constraints are indicated for each example. In general, the voicing constraint for figures 1-18 require each pitch in the harmony be voiced on a separate string. These constraints are as follows: double stops on two strings (ds2), double stops on two strings with rocking to a third (ds3), *rolling arpeggiation*⁵⁵ over two strings (arp2), rolling arpeggiation over three strings (arp3), or rolling arpeggiation over four strings (arp4). Chapter five will elaborate on voicings and voice leading patterns that can be applied to these figures.

The last five examples, 19, 20a, 20b, 21a, and 21b are all to be performed pizzicato. String crossings affect articulation much less during pizzicato passages than during arco passages. For consistent articulation through transposition of the pizzicato rhythmic figures it is not necessary to limit them to only adjacent string voicings, but it is necessary to be consistent with the way they are voiced. For this reason the voicing constraints for examples 19-21b include both adjacent string voicing constraints, as well as same string voicing constraints.

All of the pizzicato examples in *figure 4.13* use melodic shape to create meter. For example, number 20a) has a meter of three pulses plus two pulses. The lowest note in the pattern demarcates the beginning of a group of three and the highest note in the pattern demarcates the end of a group of three and the beginning of a group of two. All of the pizzicato accompaniments work much better in a lower register. Although they can be effective within the natural range of the violin, especially if melodic shape is considered carefully, they are often more effective when performed an octave lower through an *octave displacement device*⁵⁶. It is worth noting that *walking bass lines*⁵⁷ are also effective as accompaniment on violin, especially when performed through an octave displacement device. However, voicing constraints are not needed to make them rhythmically effective on the violin so it was not necessary to include them

55 Arpeggiation is a rolling bow stroke, played with broken triple or quadruple stops, so that each note of the arpeggio is played on a different string.

56 An octave displacement device is any device that alters the pitch produced by a musical instrument by an octave or more. An example of an octave displacement device is an octave pedal.

57 The term "walking bass line" comes from jazz, but base lines modelled after baroque basso continuo parts are also worth exploring.

in *figure 4.13*. Also, considerations for effective bass line construction are predominantly harmonic in nature, which would be out of place in a chapter focusing on rhythm.

Accompaniment Figures Articulated on the Violin - Rationale and Objectives

The main purpose of an accompaniment part is to support the lead part. If the accompaniment part is internalized to the point of becoming virtually automatic, then it is easier for a single performer to play both accompaniment and lead parts at the same time. The rhythmic accompaniment figures in this chapter are intended mainly as tools for composition and improvisation, rather than to be practiced as exercises in and of themselves. To be useful tools for composition and improvisation they can be combined with the voicing and voice leading principals in chapter 5.2. In order to achieve the required level of automation, the figures in this section should be practiced as written until the articulations are mastered, and then they can be played in different harmonic contexts. The majority of the articulations for each figure are a result of the way they are voiced on the violin. The intention behind this is to allow the practitioner to rely on the physicality of the pattern to create rhythmic nuance, rather than relying on conscious thought. This way, conscious thought can be reserved to create nuance with the voice.

Assigning the role of accompanist to violin and soloist to voice is the easiest way to combine both, when acting as a solo performer. The reason it is more difficult to do this the other way around is because the voice is inside the body, and so it is not possible to automate it by relying on the physicality of patterns of articulation. Both violin and voice are usually solo instruments, and are capable of a great deal of nuance with respect to tone, intonation, articulation and so on. The most difficult thing to do with violin and voice is to combine them as equal parts, because it forces the performer to focus on nuance in two voices at once. Unlike chapter 4.2, the majority of the exercises in this paper focus on the similarities between violin and voice and aim to develop the ability to create duets between them, rather than treat one as a soloist and the other as an accompanist.

Chapter Five: Harmony and Counterpoint

5.1 Counterpoint Exercises

The *Counterpoint Exercises* are presented in the order in which they are intended to be practiced. Each successive exercise builds on a skill developed in the previous one.

The *Unison Exercises* (outlined below) are grouped with the *Parallel Motion Exercises* (outlined below), because it is useful for a violinist/vocalist to imagine two voices moving in parallel motion as an extension of two voices moving in unison. When performing a unison line between violin and voice, it is relatively easy to give the unisons the same identity in the brain. Thinking of the two notes as part of the same thing makes it easier to match timbre, inflection and volume between the violin and the voice. By the same logic, it is also possible to imagine two notes played in parallel motion as having a shared identity. In this case the shared identity is defined by the type of interval between the two notes. Thinking about intervals as one thing rather than two separate notes makes it much easier for the practitioner to match timbre, inflection and volume between the violin and the voice.

Suspensions between violin and voice present a unique intonation challenge for a solo performer because they create a situation where a note must be sustained through a change in harmonic context. As discussed in the opening of this paper, for both violin and voice, intonation is contextual. When performing a suspension and resolution, a common tendency for both a violinist and a vocalist is to want to change both notes involved to match the new harmonic context. But for the suspension to be effective, the suspended note must remain completely stable through the resolution. Refining the ability to hear intervals as single identities helps with playing and singing in parallel motion, but can become problematic in the performance of a suspension.

In order to address the challenge posed by suspensions, the *Preliminary Suspension Exercises* are laid out

in a scalar context and notated (*figures 5.1a,b, and c*). When practicing these preliminary exercises it is important to be very aware of sensations, both auditory and physical. This kind of awareness will allow the practitioner to use the information and body memory developed in the exercises when in performance situations. The familiar scalar context of these exercises helps with stability in performance. Each series of suspensions in *figures 5.1a,b, and c* are relatively easy to memorize and perform as two staggered scales without paying attention to the auditory and physical sensations created by the individual suspensions and resolutions. This is a problem, because if the sensations created by the suspensions themselves are not noticed during the exercise, then they are not likely to be recalled in musical situations that are not explicitly scalar. This is why it is essential to focus on the suspensions themselves. Focusing the eyes entirely on the vertical aspect of the notated examples while performing them, rather than the melodic line is a good way to keep one's attention on the suspensions themselves. It also helps create visual analogies for suspensions in the mind, which are helpful for recall.

The purpose of the *Free Suspension Exercise and Variations* (outlined below) is to develop the ability to maintain stability in either the violin or the voice on one pitch while moving to another pitch with the other instrument. The suspensions allowed in this exercise include any two pitches played at the same time with a staggered onset. While this usage does not conform to the traditional definition of suspension, it can be useful for the purpose of these exercises, because every harmonization that fits this definition poses the same type of physiological challenge⁵⁸ for the violinist/vocalist. The term *free suspension*⁵⁹ is used to avoid any confusion with traditional definitions of the term suspension. The *Free Suspension Exercises* require the practitioner to improvise a series of free suspensions within a set of parameters. The purpose of the parameters is to draw the practitioners attention to the interval of *resolution*⁶⁰ because the clarity of this interval is what makes a free suspension effective. The basic exercise always resolves to a unison, the first variation to a diatonic third, and the second variation to a specific chosen interval. The goal of isolating these target intervals is to become comfortable with the sound/feeling of how they resolve in a number of different situations. A tritone resolving to a major

58 The challenge being discussed here is that of blending and tuning a new interval, while sustaining one note from a previous interval.

59 *Free suspensions* is a term used by the author to include any two pitches played at the same time with a staggered onset.

60 The interval of resolution is defined here as the second interval in a free suspension.

third sounds and feels very different than a major sixth resolving to a major third. Isolating the intervals of resolution allows the practitioner to create a stable tuning/timbral blend for the interval being isolated.

The final *Counterpoint Exercises* are the *Contrary Motion Exercises* (outlined below). As in the *Unison* and *Parallel Motion Exercises*, it is useful for the practitioner to imagine the harmonized intervals as one thing, rather than two separate notes played at the same time. However, it is more difficult to do this when moving in contrary motion than when moving in parallel motion, because there is one more melody to be considered. Perceiving two melodies moving in parallel motion is similar to perceiving two melodies moving in unison, because parallel motion melodies are only separated by transposition, not melodic direction. A similar sort of streamlining cannot be applied to contrary motion harmonies. In order to sing and play in contrary motion the mind has to construct the two melodies and their resultant harmonies simultaneously, rather than combining the two melodies and their resultant harmony as one continuous identity. This makes blending and intonation much more difficult.

Contrary Motion 1 addresses this difficulty by assigning one of the voices a melodic interval made up of two specific pitches with instructions to repeat it throughout the exercise. This voice becomes the point of stability around which the practitioner can get used to the sound and feeling of contrary motion. The other voice moves up through a chosen mode or pitch-set in contrary motion to the first voice. There is very little improvisation in *Contrary Motion 1*. In the basic exercise of *Contrary Motion 1* both voices move by step, so the only improvisation involved in the exercise is the choice of pitch-set. In the first variation, the repeated interval is chosen at the beginning of the exercise, so this first step becomes the only additional improvisation. The lack of choice and familiar melodic patterns in this exercise allow the practitioner to focus on the contrary motion itself. Attention should be placed on the sound and feeling of the change from one harmonic interval to the next. The goal is to make each harmonic interval feel as though has its own identity and is not just two notes sounding at the same time.

Contrary Motion 2 and variations gradually add elements of improvisation to the exercise. The basic

exercise and variations 1 and 2 alternate between one and two voices moving at the same time with each repetition of the exercise. In the basic exercise the practitioner chooses the starting note for each consecutive repetition of the exercise, but he/she is limited to stepwise motion in both voices for the contrary motion portion of the exercise. In the first variation, the practitioner chooses the interval leapt to with both voices in contrary motion, but returns to a unison for each repetition of the exercise. In the second variation, the practitioner chooses a starting interval for the contrary motion portion of the exercise, and returns to this interval for each repetition of the exercise. The third variation finally introduces continuous contrary motion between two voices. The only limitation of the third variation is that, if the two voices move towards each other on the first repetition of the exercise, they must move away from each other on the second repetition of the exercise. This limitation helps to keep the intervals relatively close, and the exercise within the vocal range. Intervals greater than an octave have a very different resonance than intervals within an octave, so it is useful to become familiar with the sound and feeling of close intervals before including more distant intervals. Also, notes sung at the top and bottom of the vocal range have a limited timbral scope, so it is much more difficult to blend them with the violin. A fourth variation might allow multiple leaps in the same direction.

The following set of exercises propose a variety of ways to practice performance of simple contrapuntal lines between violin and voice, for use in both composed and improvised contexts. It should be noted that, while rhythm is not discussed in conjunction with these exercises, all of these exercises are more effective when practiced in some sort of rhythmic context. This rhythmic context will depend on the difficulty presented by the exercise. If the exercise is relatively simple, rhythm can be used more freely. If the exercise is more difficult, assigning one or two pulses to each event will give the melodic/harmonic activity greater clarity, and create a more stable context for working out intonation problems.

Unison Exercise - Basic

1. Pick a starting pitch and a heptatonic scale.
2. Prepare the ear by playing through the scale with the violin and voice in unison, ascending and descending in steps.
3. Improvise a unison melody simultaneously with violin and voice. Start with step-wise motion, and add

other intervals one at a time, being sure to audiate everything before playing. Stay well within range of the voice, so that pitch and timbre are easily controlled.

Unison Exercise - Variations

1. Play the same exercise using any pitch-set (pentatonic scale, octatonic scale etc.)
2. Play the same exercise using a chromatic scale.
3. Play the same exercise in a heptatonic scale, but use a scale degree as a pivot note to modulate to another scale. For example: if you are playing in the scale A Ionian, imagine the fifth scale degree (E) as the third scale degree of C Ionian, and modulate accordingly.

Parallel Motion Exercise

1. Play through the previous exercise to become comfortable with improvising in a scale with violin and voice simultaneously.
2. Play through the chosen scale ascending and descending by step with the voice and the violin harmonized in diatonic parallel thirds.
3. Imagine the voice is the leader. Improvise a melody and harmonize the voice with the violin a third below. Follow the same method for developing the improvisation as in step 3 of the *Unison Exercise*.

Parallel Motion Exercise - Variations

1. Play the *Parallel Motion Exercise*, but choose a different diatonic interval with which to harmonize the voice.
2. Play the *Parallel Motion Exercise*, but change the parts for the violin and the voice. Imagine the violin is the leader and sing with the voice a third below.
3. Play the *Parallel Motion Exercise - Variation 2* (directly above) but choose a different diatonic interval with which to harmonize the violin.
4. Apply the three *Unison Exercise* variations listed above to the *Parallel Motion Exercise* and variations.

Preliminary Suspension Exercises

The preliminary suspension exercises are notated on the following three pages, *figures 5.1(a), (b), and (c)*.

These exercises are intended to be practiced in a variety of ways, which is outlined below in the Guide to Practice. Some of the exercises go below the range of the violin. The reason these lower parts are included at all is because the bottom and top two lines are meant to be played interchangeably by violin and voice. None of the exercises go out of the range of the voice. The points at which the exercises go below the range of the violin are indicated with a "*" above the staff. Fingerings for double stops between the two outside lines are indicated above the staff⁶¹.

⁶¹ Fingerings are notated for these double stops because they are not common practice patterns on the violin. Although there are a number of possibilities, consistent logic with respect to fingering choices results in consistent intonation. The author thought it would be helpful to include them.

9-8 suspensions major

7-6 suspensions major

5-6 suspensions major

4-3 suspensions major

2-3 suspensions major

minor major 6th chain

minor major 3rd chain

7-6 suspensions whole tone

4-3 suspensions whole tone

2-3 suspensions whole tone

Figure 5.1a - Preliminary Suspension Exercises

9-8 Suspensions major

7-6 suspensions major

5-6 suspensions major

4-3 suspensions major

2-3 suspensions major

minor major 6th chain

minor major 3rd chain

7-6 suspensions whole tone

4-3 suspensions whole tone

2-3 suspensions whole tone

The image displays ten musical staves, each representing a different suspension exercise in G major. The exercises are as follows:

- 9-8 Suspensions major:** A single staff starting on G4, showing a 9-8 suspension.
- 7-6 suspensions major:** A staff starting on E4, showing a 7-6 suspension.
- 5-6 suspensions major:** A staff starting on C4, showing a 5-6 suspension.
- 4-3 suspensions major:** A staff starting on B3, showing a 4-3 suspension.
- 2-3 suspensions major:** A staff starting on G3, showing a 2-3 suspension.
- minor major 6th chain:** A staff starting on E4, showing a chain of minor and major 6th intervals.
- minor major 3rd chain:** A staff starting on C4, showing a chain of minor and major 3rd intervals.
- 7-6 suspensions whole tone:** A staff starting on E4, showing a 7-6 suspension with a whole tone shift.
- 4-3 suspensions whole tone:** A staff starting on C4, showing a 4-3 suspension with a whole tone shift.
- 2-3 suspensions whole tone:** A staff starting on G3, showing a 2-3 suspension with a whole tone shift.

Each staff includes fingerings (0-4) and asterisks indicating specific techniques or starting points.

Figure 5.1 - Preliminary Suspension Exercises

9-8 Suspensions
minor

7-6 Suspensions
minor

5-6 Suspensions
minor

4-3 Suspensions
minor

2-3 Suspensions
minor

9-8 suspensions
minor

7-6 suspensions
minor

5-6 suspensions
minor

4-3 suspensions
minor

2-3 suspensions
minor

Figure 5.1c - Preliminary Suspension Exercises

Preliminary Suspension Exercises - Guide to Practice

The following is a guide to practice for the examples in *Figures 5.1(a), (b), and (c)*:

1. Initially, the two outside lines (lowest and highest) of each set of suspensions should be played as double stops on the violin.
2. Once the double stops are comfortable, the voice can be added, first on the highest line, and then on the lowest line.
3. The two outside lines can then be practiced as single lines, once with the violin on the bottom and the voice on top, and once with the violin on top and the voice on the bottom.
4. Once the performance of a set of suspensions is stable between the violin and voice, one of the inside lines⁶² can be added to the violin part⁶³. For example: the first set of suspensions in *figure 5.1a*) shows a series of 9-8 suspensions between the highest and lowest voices with three possible inner voices. The harmony in this first set belongs to the lower line. For step 4 of this exercise the practitioner plays the lowest line on the violin, along with one of the inner lines, while singing the top line.

Free Suspension Exercise - Basic

1. Choose a heptatonic scale.
2. To familiarize oneself with the scale, play and sing through the scale, ascending and descending with the violin and voice in unison.
3. Play and sing any pitch in the scale with the violin and voice in unison.
4. Move the voice to any other pitch in the scale while sustaining the first pitch with the violin.
5. Continue to sustain the new pitch in the voice, while moving to the same pitch with the violin.
6. Repeat steps 3 to 5.

Please see *figure 5.2 - Free Suspension Exercise - examples* for possible realizations of the *Free Suspension Exercise - Basic* and the *Free Suspension Exercise - Variations 1 and 2*.

⁶² It is necessary to think of the inside lines as subordinate to the two outside lines, because the intonation for the double stop that the suspended line is sung against must be stabilized against one melodic line. The inner lines are notated with square note heads to draw attention to the fact that they play a subordinate role. Each set of suspensions has a different number of possible variations for practice, depending on how wide the suspensions are and how many harmony lines fit between the lowest and highest line. For example, the series of 9-8 suspensions in *fig. 5.1* has eight possible variations for practice: double stops between the top and bottom, double stops between the top and bottom with voice on the bottom, double stops between the top and bottom with voice on the top, single lines with voice on the bottom, single lines with voice on the top, and suspension in the voice over double stops in parallel thirds, fifths and sixths.

⁶³ There are no fingerings indicated for the inside lines. This is because the double stops in parallel motion are common practice.

Free Suspension Exercise - Variations

1. Repeat steps 1 and 2 from the *Free Suspensions Exercise*. Instead of step 3, choose two pitches that create a diatonic third between the violin and the voice. Repeat step 4 of the exercise, and instead of step 5, move to a pitch with the violin that creates another diatonic third with the new pitch in the voice. Repeat steps 3 to 5 of this variation.
2. Repeat steps 1 and 2 from the *Free Suspensions Exercise*. Instead of step 3, choose two pitches that create any diatonic interval between the violin and the voice other than a third or a unison. Repeat step 4 of the exercise, and instead of step 5, move to a new pitch with the violin that creates the same diatonic interval between the violin and the voice as was chosen in step 3. Repeat steps 3 to 5 of this variation.
3. Play the *Free Suspensions Exercise* or one of its variations, but reverse the parts for the violin and voice.
4. Play the *Free Suspensions Exercise*, or one of its variations with a non-diatonic pitch-set, or a chromatic scale.

Please note: While a heptatonic scale is used in most of the free suspension exercises already outlined, and in the contrary motion exercises that follow, the choice of a starting note may change the way the scale is heard and how it functions. The purpose of the heptatonic scale in these exercises is to provide a stable frame of reference for the performer. It is not necessarily chosen for compositional or aesthetic reasons.

Free Suspension - examples

Cassie Norton

Free Suspensions Exercise - Basic - Audiating D Mixolydian

Voice

Violin

Free Suspensions Exercise - Variation 1 - Audiating G Lydian

Voice

Violin

Free Suspensions Exercise - Variation 2 - Audiating D Phrygian - Interval chosen: diatonic fifth

Voice

Violin

Figure 5.2 - Free Suspension Exercise - examples

Contrary Motion 1 - Basic Exercise

1. Choose a heptatonic scale.
2. Prepare the ear by playing through the scale with the violin and the voice in unison, ascending and descending in stepwise motion.
3. Choose a starting pitch. With the violin, ascend a diatonic second from the starting pitch. At the same time, with the voice, descend a diatonic second from the starting pitch.
4. With the violin, start on the last note played, and ascend a diatonic second. With the voice, descend a diatonic second from the starting pitch.
5. Continue to move up in stepwise motion with the violin, while repeating the same interval with the voice until the violin plays through a full octave.

Please See *figure 5.3 - Contrary Motion example* for a possible realization of *Contrary motion 1*

Contrary Motion 1 - Audiating E Dorian

The musical notation consists of two staves. The top staff is labeled 'Voice' and the bottom staff is labeled 'Violin'. Both staves are in the key of E Dorian, indicated by a single sharp (F#) on the F line. The Voice staff begins on a G4 (second line) and descends stepwise through F#4, E4, D4, C4, B3, A3, G3, F#3, E3, D3, C3, B2, A2, G2, F#2, E2, D2, C2, B1, A1, G1, F#1, E1, D1, C1, B0, A0, G0, F#0, E0, D0, C0, B-1, A-1, G-1, F#-1, E-1, D-1, C-1, B-2, A-2, G-2, F#-2, E-2, D-2, C-2, B-3, A-3, G-3, F#-3, E-3, D-3, C-3, B-4, A-4, G-4, F#-4, E-4, D-4, C-4, B-5, A-5, G-5, F#-5, E-5, D-5, C-5, B-6, A-6, G-6, F#-6, E-6, D-6, C-6, B-7, A-7, G-7, F#-7, E-7, D-7, C-7, B-8, A-8, G-8, F#-8, E-8, D-8, C-8, B-9, A-9, G-9, F#-9, E-9, D-9, C-9, B-10, A-10, G-10, F#-10, E-10, D-10, C-10, B-11, A-11, G-11, F#-11, E-11, D-11, C-11, B-12, A-12, G-12, F#-12, E-12, D-12, C-12, B-13, A-13, G-13, F#-13, E-13, D-13, C-13, B-14, A-14, G-14, F#-14, E-14, D-14, C-14, B-15, A-15, G-15, F#-15, E-15, D-15, C-15, B-16, A-16, G-16, F#-16, E-16, D-16, C-16, B-17, A-17, G-17, F#-17, E-17, D-17, C-17, B-18, A-18, G-18, F#-18, E-18, D-18, C-18, B-19, A-19, G-19, F#-19, E-19, D-19, C-19, B-20, A-20, G-20, F#-20, E-20, D-20, C-20, B-21, A-21, G-21, F#-21, E-21, D-21, C-21, B-22, A-22, G-22, F#-22, E-22, D-22, C-22, B-23, A-23, G-23, F#-23, E-23, D-23, C-23, B-24, A-24, G-24, F#-24, E-24, D-24, C-24, B-25, A-25, G-25, F#-25, E-25, D-25, C-25, B-26, A-26, G-26, F#-26, E-26, D-26, C-26, B-27, A-27, G-27, F#-27, E-27, D-27, C-27, B-28, A-28, G-28, F#-28, E-28, D-28, C-28, B-29, A-29, G-29, F#-29, E-29, D-29, C-29, B-30, A-30, G-30, F#-30, E-30, D-30, C-30, B-31, A-31, G-31, F#-31, E-31, D-31, C-31, B-32, A-32, G-32, F#-32, E-32, D-32, C-32, B-33, A-33, G-33, F#-33, E-33, D-33, C-33, B-34, A-34, G-34, F#-34, E-34, D-34, C-34, B-35, A-35, G-35, F#-35, E-35, D-35, C-35, B-36, A-36, G-36, F#-36, E-36, D-36, C-36, B-37, A-37, G-37, F#-37, E-37, D-37, C-37, B-38, A-38, G-38, F#-38, E-38, D-38, C-38, B-39, A-39, G-39, F#-39, E-39, D-39, C-39, B-40, A-40, G-40, F#-40, E-40, D-40, C-40, B-41, A-41, G-41, F#-41, E-41, D-41, C-41, B-42, A-42, G-42, F#-42, E-42, D-42, C-42, B-43, A-43, G-43, F#-43, E-43, D-43, C-43, B-44, 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C-271, B-272, A-272, G-272, F#-272, E-272, D-272, C-272, B-273, A-273, G-273, F#-273, E-273, D-273, C-273, B-274, A-274, G-274, F#-274, E-274, D-274, C-274, B-275, A-275, G-275, F#-275, E-275, D-275, C-275, B-276, A-276, G-276, F#-276, E-276, D-276, C-276, B-277, A-277, G-277, F#-277, E-277, D-277, C-277, B-278, A-278, G-278, F#-278, E-278, D-278, C-278, B-279, A-279, G-279, F#-279, E-279, D-279, C-279, B-280, A-280, G-280, F#-280, E-280, D-280, C-280, B-281, A-281, G-281, F#-281, E-281, D-281, C-281, B-282, A-282, G-282, F#-282, E-282, D-282, C-282, B-283, A-283, G-283, F#-283, E-283, D-283, C-283, B-284, A-284, G-284, F#-284, E-284, D-284, C-284, B-285, A-285, G-285, F#-285, E-285, D-285, C-285, B-286, A-286, G-286, F#-286, E-286, D-286, C-286, B-287, A-287, G-287, F#-287, E-287, D-287, C-287, B-288, A-288, G-288, F#-288, E-288, D-288, C-288, B-289, A-289, G-289, F#-289, E-289, D-289, C-289, B-290, A-290, G-290, F#-290, E-290, D-290, C-290, B-291, A-291, G-291, F#-291, E-291, D-291, C-291

Contrary Motion 2 - Basic Exercise

1. Pick a heptatonic scale.
2. Prepare the ear by playing through the scale with the violin and the voice in unison, ascending and descending in steps.
3. Start with the violin and the voice in unison. Move in contrary motion by step to the interval of a third.
4. Change the pitch of either the violin or the voice, so that they are again in unison.
5. Repeat steps 3 and 4.

Please see *figure 5.4 - Contrary Motion 2 - examples* for possible realizations of *Contrary Motion 2 -Basic* and *Contrary Motion 2 -Variations 1, 2 and 3*

Contrary Motion 2 - Variations

1. Repeats steps 1 and 2 from *Contrary Motion 2*. Instead of step 3, move in contrary motion with the violin and the voice to a diatonic interval other than a third. Repeat step 4. Then repeat steps 3 and 4 of this variation, keeping the interval chosen in step 3 the same for each repetition. *See figure 5.4.*
2. Repeats steps 1 and 2 of *Contrary Motion 2*. After step 2 (2a), play the chosen scale, ascending and descending in steps with the violin and voice harmonized at a chosen parallel diatonic interval. Instead of step 3 start with the violin and voice harmonized at the chosen interval and move in contrary motion to a new interval. Then, instead step 4, change the pitch of either the violin or the voice, so that they are again harmonized at the diatonic interval chosen in step 2a. Repeat steps 3 to 4 of this variation. Keep the interval chosen in step 2a the same for each repetition. *See figure 5.4.*
3. Repeat steps 1 and 2 from *Contrary Motion 2*. Instead, start with the voice harmonized at any diatonic interval. Move in contrary motion to a new diatonic interval. Instead of step 4, change the melodic direction of both the violin and voice, and move in contrary motion to a new diatonic interval. Repeat steps 3 and 4 of this variation. *See figure 5.4.*
4. Play the above variations with different pitch-sets (octatonic scale, pentatonic scale, arpeggio etc.)
5. Play the above variations chromatically.

Contrary Motion 2 - examples

Cassie Norton

Contrary Motion 2 - Basic - Audiating G Ionian

Voice

Violin

Contrary Motion 2 - Variation 1 - Audiating D Ionian - Interval chosen: diatonic fourth

Voice

Violin

Contrary Motion 2 - Variation 2 - Audiating C Aeolian - Interval chosen: diatonic sixth

Voice

Violin

Contrary Motion 2 - Variation 3 - Audiating D Lydian

Voice

Violin

The figure displays four musical examples of Contrary Motion 2, each consisting of a Voice staff and a Violin staff. The examples are as follows:

- Contrary Motion 2 - Basic - Audiating G Ionian:** The Voice staff starts on G4 and moves up stepwise to G5. The Violin staff starts on G3 and moves up stepwise to G4. The interval between the voices is a diatonic fourth.
- Contrary Motion 2 - Variation 1 - Audiating D Ionian - Interval chosen: diatonic fourth:** The Voice staff starts on D4 and moves up stepwise to D5. The Violin staff starts on D3 and moves up stepwise to D4. The interval between the voices is a diatonic fourth.
- Contrary Motion 2 - Variation 2 - Audiating C Aeolian - Interval chosen: diatonic sixth:** The Voice staff starts on C4 and moves up stepwise to C5. The Violin staff starts on C3 and moves up stepwise to C4. The interval between the voices is a diatonic sixth.
- Contrary Motion 2 - Variation 3 - Audiating D Lydian:** The Voice staff starts on D4 and moves up stepwise to D5. The Violin staff starts on D3 and moves up stepwise to D4. The interval between the voices is a diatonic fourth.

Figure 5.4 - Contrary Motion 2 - examples

5.2 Chording and Voice Leading on the Violin

Traditionally, both the violin and the voice are thought of as melodic or solo instruments, rather than harmonic or accompaniment instruments. The first half of this chapter treated them as such and was dedicated to the task of combining them melodically. This type of combination, where both instruments hold equal melodic importance, is typically referred to as a duet. The second half of this chapter focuses on how to use the violin as an accompaniment instrument. In Western classical violin pedagogy, training which focuses on harmonic accompaniment is sparse, and on self-accompaniment, non-existent. Chapter 5.2 defines accompaniment in the same way as chapter 4.2, and will address the harmonic components necessary to apply the rhythmic figures outlined in chapter 4.2. Just as in chapter 4.2, the materials in this section are not intended to be exercises in and of themselves, but more as tools to be used in conjunction with the materials in chapter 4.2 for composition and improvisation.

Although harmonic thinking is not often part of Western classical violin pedagogy, it does exist in the repertoire. The largest most common example, J.S. Bach's solo violin *Sonatas* and *Partitas*, function very well as solo pieces, because the violin is treated as both a melodic and harmonic instrument. Two modern examples which behave similarly include; Eugene Ysaie's *Six Sonatas for Violin* and Eckhart Gramatte's *Ten Violin Caprices*. Harmonic thinking with respect to the violin is relatively common in folk fiddle traditions where the second fiddle part (or accompaniment) is improvised. In this case it is necessary to hear the harmonies implied by the melody, and find the most natural way to play them on the violin. Fiddle accompaniments are almost always in the form of double stops (two notes played at once), because any more than two notes at once must be arpeggiated, which limits the rhythmic possibilities. When a fiddle player invents a harmony he must choose his/her notes carefully, considering the melody, the desired harmony, as well as voicing and voice leading. In general, voicing and voice leading are very important considerations on the violin, because intonation must be acknowledged for each individual note. If the voicing or voice leading is awkward, too much attention will be required for intonation, detracting from the clarity of the rhythm. The harmonic thinking in this section is derived from the Western classical solo violin repertoire mentioned above, North American and European folk fiddle traditions, as well as general voice leading principals in jazz.

The most practical way for a violinist to think about the violin as a harmonic instrument is to become familiar with the relationship between musical intervals and the physical shape of the hand across the four strings. For example: a minor sixth on an adjacent string is made by putting one finger on the lower string and a second finger beside it on the higher string slightly closer to the bridge. If all of the intervals are imagined in this way then interval patterns or chord shapes can be quickly realized without acknowledging all of the individual notes. For fretted string players, especially in the context of jazz, rock, and folk music, this way of thinking is very common.

Chord shapes with no open strings can be transposed or moved into any key simply by sliding the hand up and down the fingerboard without changing the relationship between the fingers. On a fretted string instrument this type of chord shape is called a barre chord. On the violin, barre chords are not necessary because there are four fingers available for each of the four strings. Also barring strings on the violin makes intonation difficult to control, so for multiple reasons the term "barre chord" is not a useful reference to the violin. Instead this type of chord shape will be referred to as a moveable chord.

Fretted string players often learn chord shapes through fretboard diagrams rather than through musical notation. Fretboard diagrams are "to scale" representations of the finger placement for the chord in question. This kind of representation helps the string player visualize chord shapes in his/her mind, seeing how interval relationships manifest themselves physically on his/her instrument. Moveable chords are especially useful shapes, because they can be used to express the same harmonic relationships in any key. Imagining the violin as a fretted instrument makes it much easier for the a violinist to visualize the interval patterns necessary to create chords. Thus, the material in this section will be represented in the form of fretboard diagrams rather than in musical notation.

The mandolin is a fretted instrument with the same tuning and a similar fretboard scale to the violin. There are plenty of fretboard diagrams available for mandolin, and it would seem that the study of these would be the most direct route to thinking harmonically on the violin. To some extent this is true. However, the physical ease of chord shapes as well as the physical ease of voice leading between one

chord shape and the next must be considered more on the violin than on the mandolin, because the degree of precision required for intonation on a violin is much greater than on a mandolin. As a result, some chord shapes which are reasonable on the mandolin are extremely awkward or impossible on the violin.⁶⁴ For this reason, a separate system for voicing chords on the violin is useful.

When developing such a system, the first thing to consider is the left hand itself. When voicing a four-note chord, the left hand has the most flexibility and control when the index finger falls on the G string, and the remaining three fingers fall on the adjacent strings in order from lowest to highest; the middle finger on the D string, the ring finger on the A string, and the pinky on the E string. The second most flexible position for voicing a four-note chord is constructed in the opposite way; with the pinky falling on the G string, the ring finger on the D string, the middle finger on the A string, and the index finger on the E string. The former hand position will create intervals of sixths, sevenths, octaves and ninths. The latter hand position will create intervals of fourths, thirds, seconds and unisons. Fifths can be created by depressing up to two strings with the same finger. This latter hand position is useful for two-note chords and three-note chords, but less useful for four-note chords. For example, it is next to impossible to voice a root position seventh chord in thirds across the four strings of the violin. Dyads of thirds are easily voiced, and triads are difficult. Physically, the easiest way to voice tertian harmony on the violin is in an open voicing⁶⁵ built in fifths, sixths, and sevenths. On the violin, these intervals create the closest, most flexible physical spacing between fingers on adjacent strings. If suspended chords are desired, fourths can be added. Diminished fifths and fourths require the fingers to move across the strings in the less flexible direction, but the finger spacing for these intervals is small enough on adjacent strings that they are playable within the context of a four-note voicing.

Although four-note voicings offer the most harmonic possibilities on the violin, they limit the rhythmic possibilities because they must be arpeggiated. For this reason it is also useful to consider possibilities for

⁶⁴ Although not all mandolin chords are transferrable to the violin, playing the mandolin as a violinist will improve one's ability to think harmonically on the violin.

⁶⁵ Open voicing can be defined in relation to closed voicing. Closed voicing describes the closest possible arrangement of pitch classes that make up a harmonic structure or chord. For example, a root position close voiced C major triad could be spelt C₄, E₄ and G₄. Open voicing describes an arrangement of pitch classes, or chord, that is not in the closest possible voicing. For example, a root position C major triad in open voicing could be spelled: C₄, G₄ and E₅.

two and three-note voicings. Understanding how dyads can imply triads and even seventh chords through voice leading is essential for creating meaningful double stop harmonies. Even if stacked thirds are difficult to voice on the violin, a single third is often useful in a series of voice led double stops. Practicing root position triads helps one develop awareness of possible harmonic contexts for all of the dyads in a triad. The fretboard diagrams in *figure 5.5* show a series of root position, first inversion, and second inversion triads in closed voicing. The chords are named by the quality of their intervals, using a system which is common in jazz, pop and rock music⁶⁶

The strings are shown as if the viewer is looking down the neck of the violin, the G string is the furthest to the left, and the E string is the furthest the right. The space between each note in the chromatic scale is delineated with a line, and the notes are shown as circles on the spaces between the lines. For example, the circle in first space on the G string represents Ab3, the circle in the second space represents A3 and so on. This visual analogy is modelled after a typical fretboard diagram for mandolin. Each note in the voicing is labelled as an interval in relation to the root, rather than with a specific pitch. This is because the entire voicing should be thought of as a set of interval shapes, rather than as a set of specific pitches. The root is indicated with a blue letter "R," major intervals are indicated with a "Δ," minor intervals are indicated with a "b," perfect intervals are indicated with a "P" and augmented intervals are indicated with a "#." All but the root position diminished triad can be moved (transposed) anywhere, up and down the fingerboard, or on any three adjacent strings. In the few instances where the voicings are not movable, voiced open strings are indicated with a filled in black circle.

66 For a guide to the system used for naming chords in this paper please see appendix D.

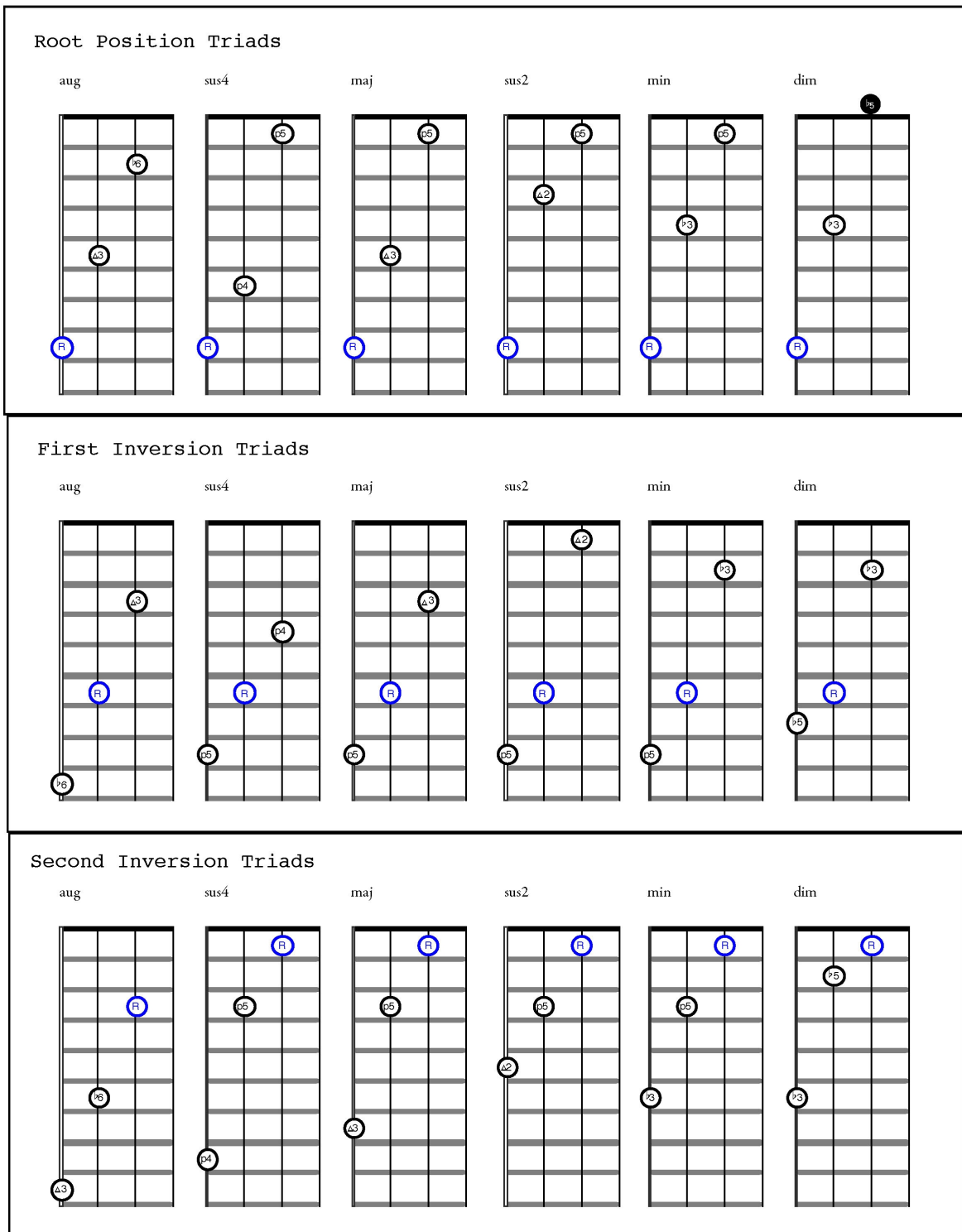


Figure 5.5 - Root Position Triads for the Violin

Figure 5.6 shows a series of triads voiced in 5ths, 6ths, 7ths, and 4ths. This is physically the easiest voicing, and so most functional for playing triads on the violin.

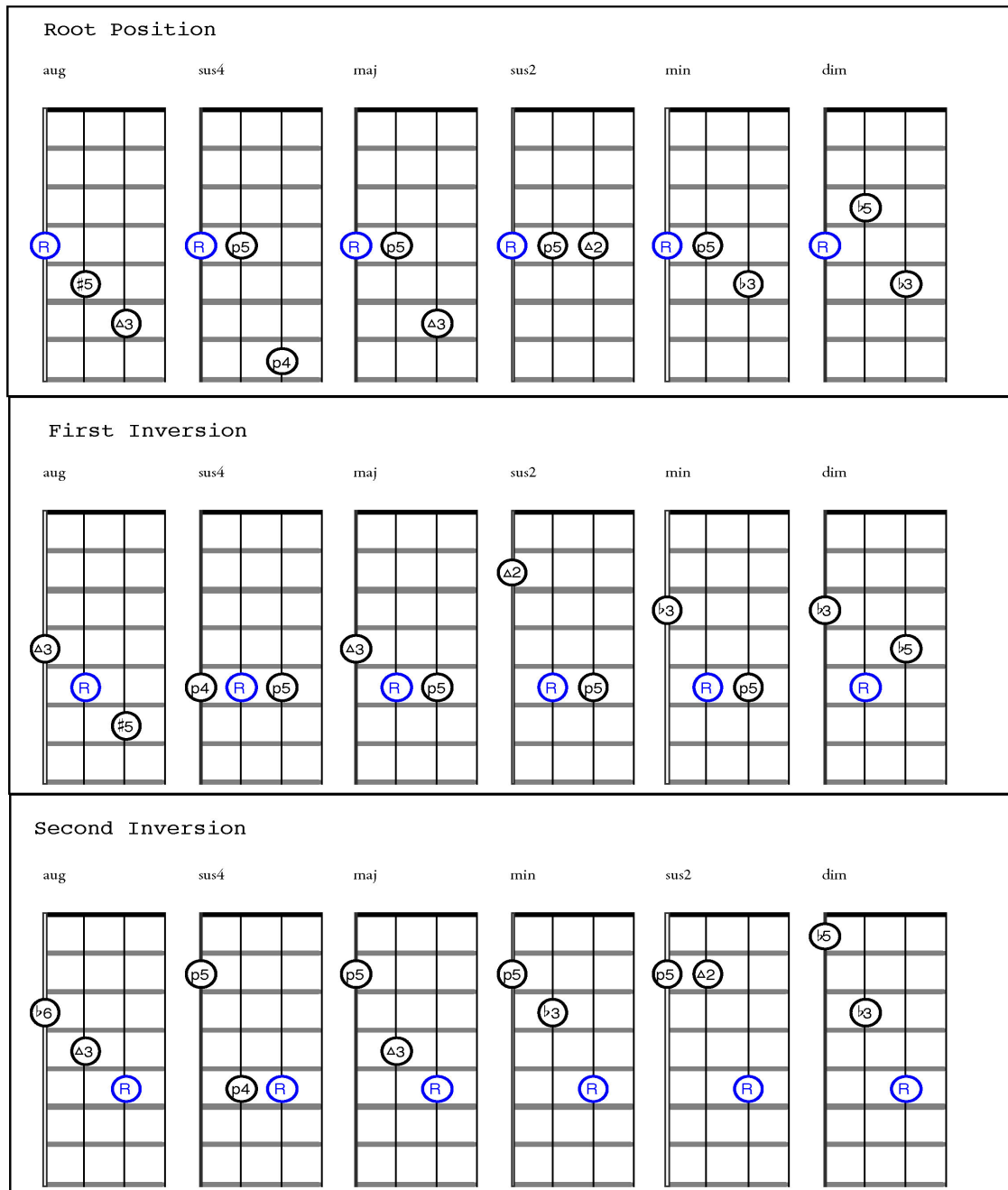
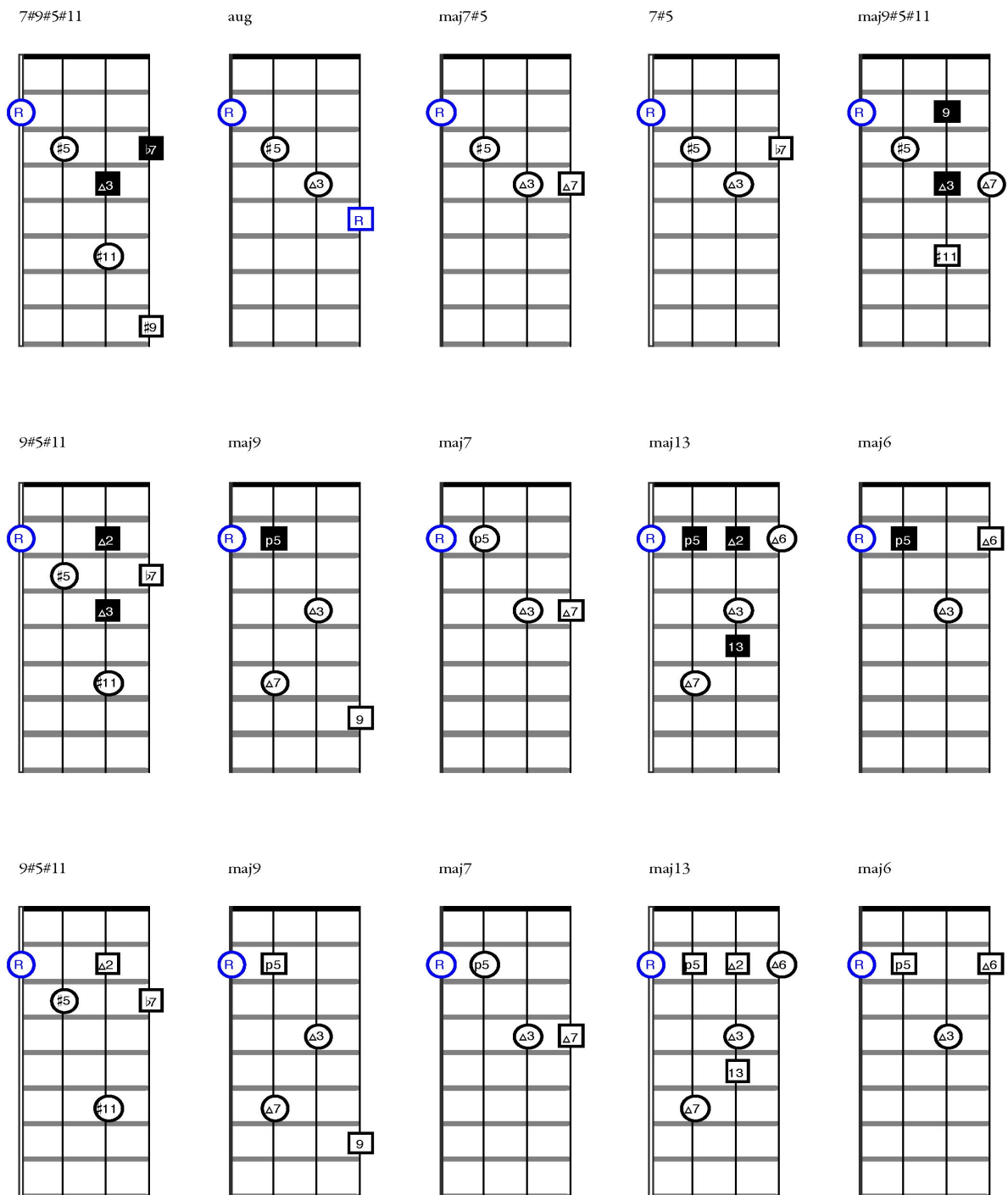


Figure 5.6 - Open Voiced Root Position Triads

Figures 5.7a and 5.7b show a series of four-note chords voiced in 5ths, 6ths, 7ths and 4ths and grouped into families of augmented, major, dominant (major/minor), minor and diminished. The physical difference between consecutive chords, reading from left to right, is shown with a square around the interval responsible for the change. To obtain some chord types not all of the intervals can be voiced at once. In this case the missing interval is indicated with a solid black square. This allows the practitioner to be aware of other voicing possibilities for the same chord. This is important, because the best voicing of a given chord will change depending on the harmonic context.

To develop good intonation with four-note chords it is useful to notice where the shapes are similar and where they are different, and practice the chords that are most similar one after another, changing only one note at a time. *Figure 5.8* is a display of the same chords from *figure 5.7a and 5.7b* arranged according their physical similarity. All consecutive chords in both the horizontal and vertical directions, within the blue area and purple area respectively only have one note difference between them. All consecutive chords in the horizontal direction within the green area have only one note difference between them. The physical difference between consecutive chords, reading from left to right, is shown with a square around the interval responsible for the change, as it was in the *figures 5.7a and 5.7b*. The physical difference between consecutive chords is not indicated in the vertical direction.

It should be noted that there is an overlap of chord shapes between *figure 5.7a and 5.7b* and *figure 5.8*. To show the flow from most similar to most different in both directions it is necessary to put all of the seventh chords on one page (*figure 5.8*), but when the chord shapes are shrunk to this size, some of the intervals become unreadable. The author has chosen to display these chord shapes twice, *figures 5.7a and 5.7b* for readability of the intervals, and *figure 5.8* to show a logical order for intonation practice.



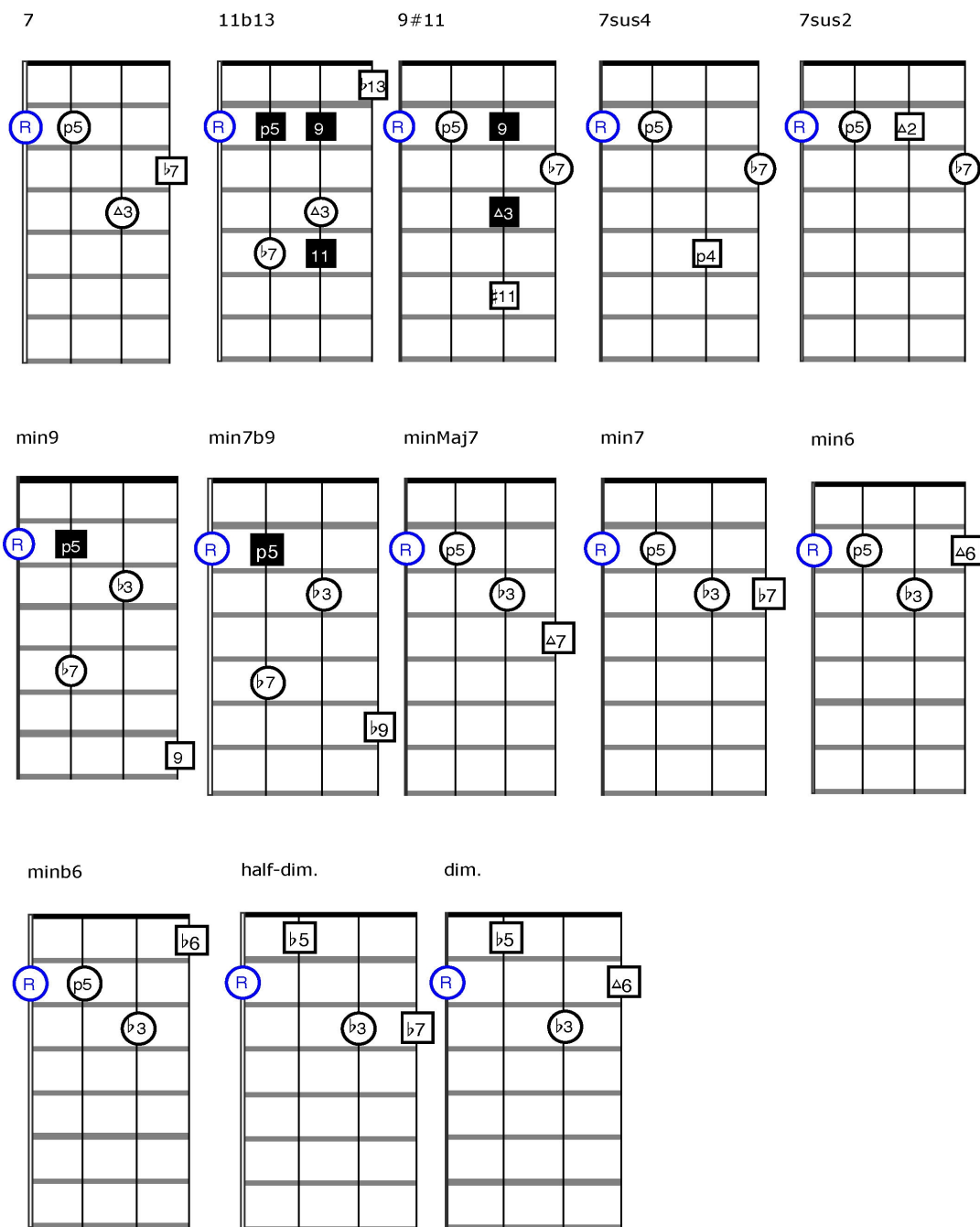
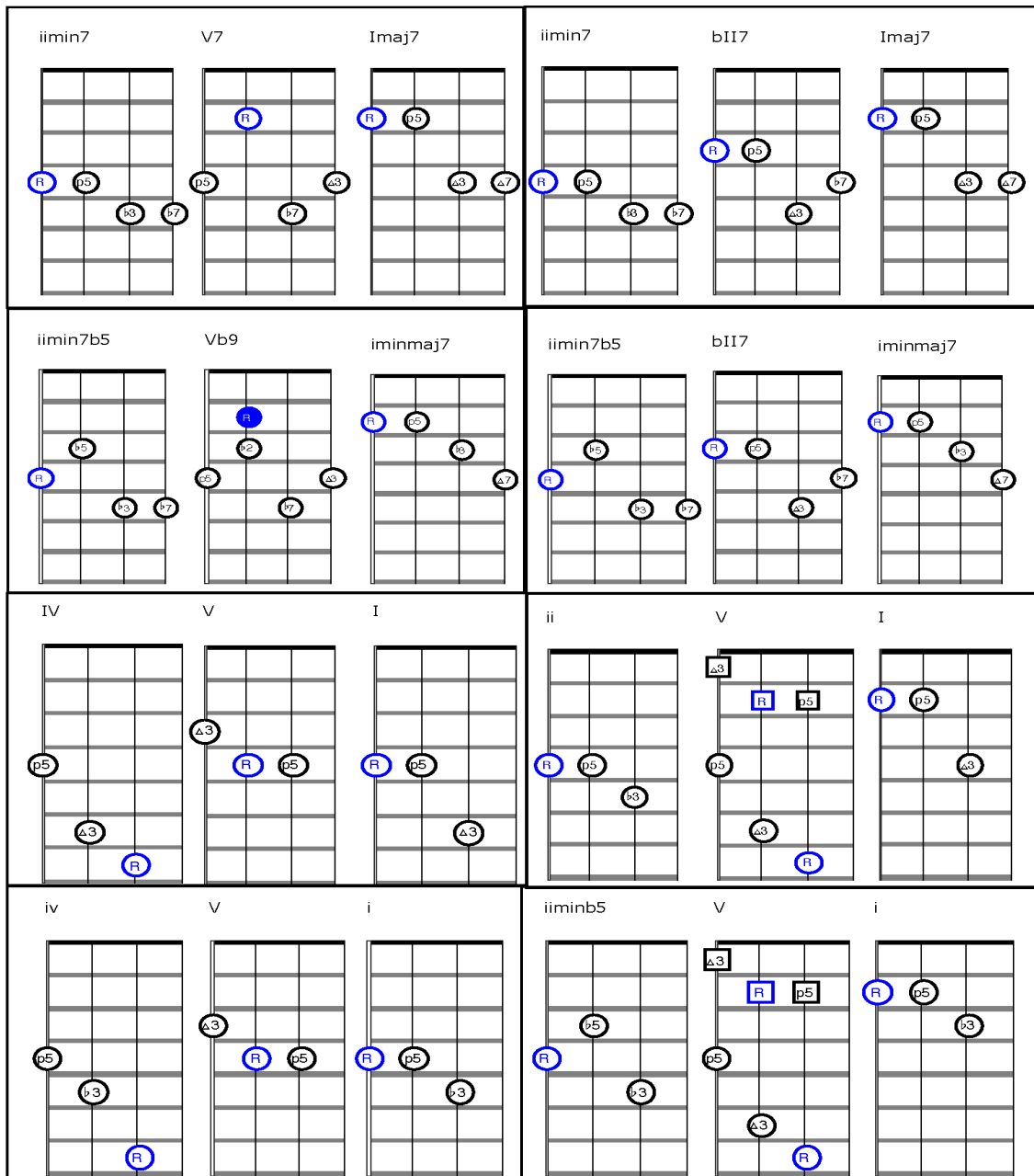


Figure 5.7b - Open Voiced Seventh Chords for Violin

Augmented									
7#9#5#11	aug	maj7#5	7#5	maj9#5#11	9#5#11				
Major									
maj9		maj7	maj13	maj6	maj9#11	maj7sus4	maj7sus2		
Dominant									
9	b9	7		11b13	9#11	7sus4	7sus2		
Minor									
min9	min7b9	minMaj7	min7	min6	minb6				
Diminished									
					half-dim.	dim.			

Figure 5.8 - Seventh Chords for Violin Arranged for Intonation Practice

Figure 5.9 shows fingerboard diagrams for a few simple chord progressions voiced in fifths and sixths on the violin.



Each black box contains one progression. The square enclosures around intervals indicate an alternate voicing.

Figure 5.9 - fingerboard diagrams for Simple Chord Progressions on the Violin

There are endless progressions that could be written out in this way. The examples in *figure 5.6* have been included to illustrate how voice leading can be shown with fingerboard diagrams for violin. The purpose of writing out chord voicings and harmonic progressions in this way is to help the practitioner develop a stronger physical awareness of the way harmony plays out on the fingerboard of the violin. Fingerboard diagrams are a much more direct path to this than Western notation because intervallic patterns can be shown exactly as they lie on the fingerboard of the violin. Also the same patterns can be applied to different pitches without any of the mental work involved in transposition, simply by moving the same shapes up, down or across the finger board.

Rational and Objectives

The materials in chapter 5.2 are mainly to inform a way of thinking about harmony and voice leading on the violin that is conducive to improvised and composed accompaniment. However, to become familiar with the materials they should be practiced. The rhythmic accompaniment patterns in section 4.2 can be combined with the chord voicings or voice leading patterns in section 5.2, and short studies can be made from the resulting combinations. Beyond that, the information in sections 4.2 and 5.2 can inform a way of thinking about the violin as an accompaniment instrument. This way of thinking can be used in future improvisation and composition.

Chapter Six: Studies and Short pieces for Violin and Voice

This chapter contains a series of short studies and pieces for violin and voice that were written in conjunction with the exercises in this paper. Some of them were written in order to become more comfortable with a specific technique. Others were inspired by improvisations on the materials in the exercises, and still others were written as an exploration of the possibilities available to violin and voice. In this last case the study would often inform the writing of an exercise, because I would usually write something that I was not initially able to perform. As with most exercises and studies, the studies in this chapter are mono thematic and focus on either one technique or one musical idea. I found reference to Bach's Preludes for violin, cello and piano, and to a lesser extent Chopin's Piano Preludes was helpful for remaining focused with these short pieces.

6.1 *Bartok Study 1 (figure 6.1) and 2 (figure 6.1a)*

These two studies were the first pieces I wrote with the specific intention of challenging myself as a violinist/vocalist. They are both inspired by Bartok's violin duets and aim to take a similar form and style. However they are written for violin and voice rather than for two violins. The only distinctions made between the violin and vocal parts in these duets, is that the violin parts include double stops and a slightly larger range. Both of these duets have sections in which the violin and voice are set against each other in canon. In *Bartok study 1* the canonic section starts on the third beat of measure ten and ends on the second beat of measure fourteen. In *Bartok Study 2* the canonic section is slightly shorter, starting on the third beat of measure twelve and ending on the second beat of measure fifteen. Both of these canonic sections culminate in extreme dissonance. In *Bartok Study 1* a minor second between G#4 in the voice and G4 in the violin in the last two beats of measure thirteen resolves to a unison on G4 between the violin and the voice in measure fourteen. In *Bartok Study 2*, the same minor second interval, this time with G#4 in the violin and G4 in the voice at the end of measure fourteen is left unresolved, with the voice dropping a minor ninth to G3, and the violin dropping a minor second to G4 at the beginning of measure fifteen. Another important characteristic of *Bartok Studies 1 and 2* is that the violin and vocal parts do not have the same dynamics. This is most pronounced in the canonic sections. These three

musical elements: canon, close harmony, and offset dynamics between the violin and vocal parts become the focus of the studies because they are extremely difficult to perform as a violinist/vocalist. The process I went through learn to play these two pieces has informed a large part of this paper.

6.2 *Study in Fifths and Sixths* (figure 6.2)

This study is based on *Chopin's Prelude in Em (Op.28 no.4)* for piano. The first inversion voicing that characterizes the piece can be implied with only two notes and falls very nicely into double stops on violin. The right hand melody is quite simple and lyrical, and can be easily sung. This has an ideal texture to be adapted to violin and voice. *Study in Fifths and Sixths* is a piece that uses similar, but paired down voicing principles, and similar form to Chopin's Prelude in Em.

6.3 *Soft Light* (figure 6.3)

Soft Light was written using accompaniment patterns 5a and 5b from section 4.2 in combination with voicing and voice leading principals developed in section 5.2. The song grew out of an improvisation which was inspired by Duke Ellington's *African Flower*. In the form presented in this paper, *Soft Light* is a complete song with no improvisation. However, the intention in writing this song was to become confident improvising variations both vocally and with the violin. Presently, I am working on improvising the vocal part and the violin part separately. The improvisation of the vocal can be guided by the alternating figure (either alternating in major seconds or minor thirds), while the improvisation of the violin part can be guided by the rhythmic figure, and the type of voicing set up in the written piece. The exercises in this paper have provided me with the tools necessary to develop this type of improvisation.

6.4 Late Morning (figure 6.4)

Late Morning is based on rhythmic accompaniment figures 7a) and 7b) from chapter 4.2 and on voicing and voice leading principals in chapter 5.2. Like *Soft Light* this study also grew out of an improvisation, but has developed into a set piece.

6.5 Calm in the Storm (figure 6.6)

The first part of *Calm in the Storm* is improvised. Listen to a recording here:

<https://soundcloud.com/cassienorton/calm-in-the-storm/s-DfzZT>

The concept for this improvisation came after the piece was written. The melody for the piece grew out of the voice leading in the accompaniment. The intention of the improvisation is to expose the relationship between the melody and the accompaniment in the piece. In the written part of the piece, the accompaniment is performed on the violin, and the melody is sung. In the improvised part of the piece, the accompaniment is provided by the voice, and the melody is played on the violin. I specifically chose to make the voice an accompaniment for this improvisation in order to practice using it, rather than the violin, as a point of stability. The accompaniment for the written part of *Calm in the Storm* is based on rhythmic accompaniment figure 8a) from chapter 4.2 as well as the violinistic voicing principals outlined in chapter 5.2. The words were inspired by melody and the accompaniment.

Bartok Study no.1

Score

Cassie Norton

$\text{♩} = 90$

Voice

Violin

p

mp all notes sung on "dah"

f

mf

mp

f

f

mp

p pizz. *mp*

arco

The musical score for Bartok Study no. 1 is presented in a standard notation format. It features two staves: Voice and Violin. The tempo is indicated as quarter note = 90. The score is divided into systems with measure numbers 3, 7, 11, 14, and 18. The Voice part includes the instruction 'all notes sung on "dah"'. The Violin part includes dynamic markings (p, mp, f, mf) and performance instructions (arco, pizz.). The score is written in 4/4 time and includes various musical notations such as notes, rests, and slurs.

Figure 6.1a - Bartok Study no.1

Bartok Study No. 2

Score

Cassie Norton

$\text{♩} = 120$

all other notes sung on "dah"

Voice

Violin

arco

mp bum bum

mf

mp

mf

f *p*

f *p*

p pizz.

f

f

arco

Figure 6.1b - Bartok Study no.2

Study in Sixths

Cassie Norton

$\text{♩} = 84$

Voice

All notes sung on "dah"

mf

Violin

mp

a tempo

rit.

Figure 6.2 - Study in Sixths

$\text{♩} = 128$ **Soft Light**

Cassie Norton

all notes sung on "dah"

Voice

Violin

mp

mp

mp

mf

mf

p

Figure 6.3 - Soft Light

Figure 6.3 - Soft Light (cont.)

This musical score is for a piano piece titled "Soft Light (cont.)". It is written for two staves, likely representing the right and left hands. The key signature has one flat (B-flat), and the time signature is 4/4. The score is divided into measures, with measure numbers 29, 33, 37, 41, 45, 49, and 53 marked at the beginning of their respective systems. The dynamics are marked as *mf* (mezzo-forte) at measure 29 and *mp* (mezzo-piano) at measure 45. The notation includes various note values (quarter, eighth, and sixteenth notes), rests, and slurs. The piece concludes with a double bar line at the end of the final system.

Figure 6.3 - Soft Light (cont.)

Late Morning

Cassie Norton

$\text{♩} = 140$

Voice

Violin

mp chop

5 sing all notes on "dye"

mp

11 *mf*

normale chop

17 *mf*

normale chop

Figure 6.4 - Late Morning

2

23

23

normale

subito p

29 *a tempo*

mp

29 *a tempo*

chop

normale

35

35

chop

mp

41

41

47

47

mp

Figure 6.4 - Late Morning (cont.)

Calm in the Storm

Cassie Norton

The musical score for "Calm in the Storm" by Cassie Norton is presented in a two-staff format: Voice and Violin. The key signature is one sharp (F#), and the time signature is 4/4. The score is divided into six systems, each with a measure number (1, 3, 5, 7, 9, 11) at the beginning of the first staff. The lyrics are written below the voice staff, and the violin part is written below the voice staff. The score includes various musical notations such as notes, rests, and dynamic markings like *sim.* (sforzando). Chord symbols (G, C, C^m, G, E^b, E^m) are placed above the voice staff at the start of each system. The lyrics are: "come now be still the things that we've done are things we can't change and when the thoughts stop the breath still re - - - mains and that".

1 G C
Voice come now
Violin
3 G C *sim.*
be still the
5 C^m G
things that we've done are
7 C^m G
things we can't change and
9 E^b E^m
when the thoughts stop the
11 E^b E^m
breath still re - - - mains and that

Figure 6.5 - *Calm in the Storm*

13 Ebmaj7#11 Gaug G

lit tle voice in the back of your head it's

15 A sus4 Emin

al right to

17 A sus4 Emin

shut it off

19 A sus4 Emin

let me hear

21 A sus4 G

sound heart

The musical score is for a song in G major, 4/4 time. It features a vocal melody and a piano accompaniment. The piano part consists of a steady eighth-note pattern in the right hand and a more complex eighth-note pattern in the left hand. The vocal melody is written in treble clef. The lyrics are: 'lit tle voice in the back of your head it's al right to shut it off let me hear sound heart'. The score is divided into five systems, each with two staves. The key signature has one sharp (F#). The tempo is marked 'Calm in the Storm'.

Figure 6.5 - *Calm in the Storm* (cont.)

Chapter Seven: Four Songs For String Trio and Voice

Introduction

The four songs in this chapter were arranged for a specific group of musicians: Cassie Norton (myself) on voice and violin, Emilyn Stam on five string violin, and Eli Bender on cello. Eli and Emilyn are both creative and competent improvisers and sight readers. As well, they both have experience singing and playing with their instruments. Eli is someone whose advice I have sought on this topic. Eli and Emilyn are both most comfortable playing folk styles. These pieces were arranged taking into account the specific capabilities of each member of the group, while also considering how they might be adapted for different musicians.

Two of the pieces were completely arranged, and all the parts (other than mine) were primarily sight read during the recording. The other two pieces were arranged, but the parts were mostly improvised. In the pieces in which the parts were completely composed, there were some sections in which I gave Emilyn and Eli the option to improvise. The amount written for each of these songs was informed by the songs themselves and the group I was writing for.

Live recordings and video of these songs were made at ArraySpace in Toronto at the end of July, 2015. The recordings of these songs are not perfect. I was not at the level I needed to be at with violin and voice to play and sing my parts as expressively or as accurately as they needed to be for the songs. However, compositionally they show potential for what can be done with strings and voice. As well, they expose some of the challenges addressed in the exercises.

7.1 Quiet Wilderness

Before reading, please see the score (*figure 7.1*) and watch the live video here:

<https://www.youtube.com/watch?v=45hI2bqxRgo>. *Quiet Wilderness* is piece that I originally wrote for guitar and voice. Of the four pieces, it is the most heavily arranged. I felt the need for a lot of

arranging in *Quiet Wilderness* because the harmonic structure is relatively complex. There is an improvised violin solo for Emilyn at the beginning of the song, and a group improvisation at the end. Other than that, all of the parts were written out, including dynamics and articulations. *Quiet Wilderness* includes extensive switching between pizzicato, arco and at the very end colengno battuto, creating considerable textural contrast against the voice.

7.2 Civilization

Before reading, please see the score (*figure 7.2*) here, and live recording here:

<https://www.youtube.com/watch?v=-ZQcCLzS1TA>.

Civilization is another piece that was originally written for guitar and voice. I wanted an improvised feel in this piece, but had specific ideas in mind that aren't completely idiomatic of folk fiddle traditions. To achieve this I wrote out all the parts, and then specified which sections I would prefer to be improvised. I also included the chords in the parts. My own violin part in *Civilization* is specifically challenging to play with voice, because it includes shifting to a double-stop at the onset of a sung note. This is one of the most challenging things to do with violin and voice, because it requires audiating pitch for both the violin and the voice at the same time. Exercises in chapter two and chapter three address this challenge. At the time we recorded the piece I was still in the process of developing my skill-set using these exercises. The take we made of *Civilization* demonstrates this. At 0:42 the onset of the vocal corresponds with a double stop shift, and the intonation of my violin suffers. At 1:32 I play the same line again on violin as accompaniment to Emilyn's solo. At this point the intonation of my violin is much better because I'm not singing at the same time. I play the same line again at 1:52 underneath another verse, and the intonation of my violin is a little worse than at 1:32, but better than at 0:42. The full attention given to the violin part when it was used to accompany Emilyn's solo helped me stabilize it as an accompaniment part, making it somewhat automatic the next time I played it under my voice, but still I could not make the minor adjustments necessary to fix the intonation with the violin while I was singing. This is something I am still working on. This recording of *Civilization* highlights what I need to work on to make my violin and

voice stronger together. I asked Emilyn and Eli to sing back-up vocals with me at the end. Emilyn's voice enters at 3:41 and Eli's voice enters shortly after that. I did not write out the vocal parts, because I wanted them to be improvised (as back-up vocals often are in folk music).

7.3 Has to be Finished

Before reading, please see the score (*fig. 7.3*) here and the live recording here:

<https://www.youtube.com/watchv=DBJpMZ4rIXQ>.

Has to be Finished is one of the first songs that I wrote specifically for violin and voice, so it seemed like a natural choice for the string trio. In context of the four compositions in this chapter it requires the most flexibility from the performers. For the majority of the piece, both Emilyn and Eli are required to improvise their parts within a set chord structure. However section B (m.21 - m.28) is entirely composed, and sections C (m. 29 - m.31) and C1 (m. 63, 64) are entirely improvised with no set chord structure. The piece would not work without musicians who were comfortable improvising in many contexts.

The challenge of *Has to be Finished* for me, is in transitioning through all of the mind-sets required to communicate the content of the different sections. Sections A, B, and A4 require me to perform with the headset of a violinist/vocalist, sections A, A2, A3, B1 and B2 require me to perform with the headset of a fiddler, whereas sections C and C1 require me to perform with the headset of an improviser. Each of these roles requires a different kind of focus to pull off convincingly. To sing my own songs effectively, the majority of my attention needs to be placed on communicating an emotional message. When performing as a violinist/vocalist a great deal of attention must be placed on the blend between the violin and the voice. The challenge as a violinist/vocalist, in the context of a song like *Has to be Finished*, is to ground the attention needed to communicate an emotional message in the blend between the violin and the voice. I find this is best done through physical awareness of resonance, both in the voice in and the violin. When performing as a fiddler my attention is grounded in either a pre-set melody or a pre-set chord progression. This structure allows the rest of my

attention to focus on expressive details like ornaments, swells, and blending with the other instruments. When performing as an improviser I must balance a boldness and commitment to my own ideas with an awareness and responsiveness to others. The different kinds of attention required for all of the sections in *Has to be Finished* make it a challenging piece to perform as a violinist/singer.

7.4 Yellow Flowers

Before reading, please see the lead sheet (*fig. 7.4*) here and the live recording here:

<https://www.youtube.com/watch?v=2d-mpAbLwws>.

Yellow Flowers is a song for my grandmother who passed away at the end of 2013. I wanted to give Emilyn and Eli as much freedom as possible with this piece because I wanted it to sound like folk music and feel improvised. Emilyn and Eli are both more experienced with folk music than I am. Instead of a score, I gave them the chords and the lyrics and some instructions about the dynamic shape of the piece.

For most of *Yellow Flowers* the vocal style and the violin style are similar. They are both slow and sustained. The challenge for me with these parts was to blend the timbre of my voice with my violin, without losing the expressivity in my voice needed to convey the lyrics. At 2:15 I cue a meter change from 3/4 to 4/4 with the violin while sustaining the end of the phrase in 3/4 with the voice. This is the kind of ability with violin and voice that I had hoped to achieve through the exercises in this paper. At 2:46 I sing the same kind of sustained vocal style over top of a more rhythmic violin part. In this section the rhythmic control between my violin and my voice is good, and the emotional delivery with both the voice and the violin accompaniment is also good, but the intonation and blending need further work.

Quiet Wilderness

♩ = 106

Cassie Norton

Violin

Violin

5 string Violin

Voice

Violin

Voice

Violin

pizz.

mf

3x

C

A m

3x

violin solo

B

mp

E - ve - ry - thing goes a - round you, so the

mf

peo - ple go a - round you. It's im - pos - si - ble to su - press. And

arco

Figure 7.1 - Quiet Wilderness (pg.1)

2 C

17

Voice

your walls ____ are o - ver flow - ing with eve - ry - thing that's grow - ing. Your

Violin

5 string Violin

Cello

arco

21 D

Voice

bo - ta - ny is a cure for the tame. Be - cause in - side eve - ry one of us a wild heart sleeps si - lent - ly.

Violin

5 string Violin

Cello

arco

pull

pull

pull

Figure 7.1 - Quiet Wilderness (pg.2)

25

Voice

25

Violin

25

Voice

Vlc.

29

Voice

29

Violin

29

Voice

Vlc.

got-ten in the drea-ry-ness of our days. *mp* And eve-ry time I pass by you,

pizz. mp

8^{vb} pizz. mp

p ponticello

E

Figure 7.1 - Quiet Wilderness (pg.3)

4

33

Voice

33 I can on - ly smile. I want to tell you all these things but

Violin

33

5 string Violin

Cello

37

Voice

37 we share so few words. But now win-ter's come a - gain and your chil-dren sleep si-lent-ly

Violin

37

5 string Violin

37

Cello

F

mf

arco pull

normale

arco

mf

pull

normale

mf

pull

Figure 7.1 - Quiet Wilderness (pg.4)

The musical score is divided into two systems. The first system (measures 41-44) features a vocal melody in the upper voice, with lyrics: "wai-ting for the spring to come and pla - y. But the cold grey". The violin and viola parts provide harmonic support with sustained chords and moving lines. The second system (measures 43-46) continues the vocal melody with lyrics: "sky swal - lowed up your lit - tle flow - er shop". The violin and viola parts continue with sustained chords, while the vocal part has a more active melody. The viola part in the second system is marked with a sharp sign, indicating a key signature change.

41

Voice

wai-ting for the spring to come and pla - y. But the cold grey

Violin

41

Voice

41

Vlc.

43

Voice

sky swal - lowed up your lit - tle flow - er shop

Violin

43

Voice

43

Vlc.

Figure 7.1 - Quiet Wilderness (pg.5)

45

Voice

45 No-one saw it burn-ing in the night. And the peo-ple stared, oh it was such a fun e - ral.

Violin

45

5 string Violin

Cello

49

Voice

49 We did-n't know what you hid un - der ground. And you don't have to re - build your - self, when

Violin

8^{va}

49

5 string Violin

Cello

G *a tempo* *mp* *mp pizz.*

Detailed description: This is a musical score for a piece titled 'Quiet Wilderness' on page 6. The score is written for four staves: Voice, Violin, 5 string Violin, and Cello. The first system (measures 45-48) features a vocal melody with lyrics 'No-one saw it burn-ing in the night. And the peo-ple stared, oh it was such a fun e - ral.' The Violin and 5 string Violin parts play a rhythmic accompaniment of eighth notes, while the Cello part provides a bass line. The second system (measures 49-52) continues the vocal melody with lyrics 'We did-n't know what you hid un - der ground. And you don't have to re - build your - self, when'. The Violin part includes a section marked '8^{va}' (octave up) and 'pizz.' (pizzicato). The 5 string Violin and Cello parts continue their respective lines. Dynamic markings include 'mp' (mezzo-piano) and 'a tempo' (return to tempo). A box containing the letter 'G' is placed above the vocal staff in measure 51.

Figure 7.1 - Quiet Wilderness (pg.6)

53

Voice

53 you can grow a - gain. Yeah you hid your seeds in the a - shes and you

Violin

53

5 string Violin

53 C A m

8^{vb} pizz. *mp*

57

Voice

57 came back with the spring.

Violin

57

5 string Violin

57 C G C

solo arco *mp*

Cello

57

subito *p*

H

Figure 7.1 - Quiet Wilderness (pg.7)

8

61

Violin

61

5 string Violin

A m C A m

Cello

67

3

mp

Ev - e - ry - thing grows round you, so the

67

Violin

67

5 string Violin

C A m

Cello

Figure 7.1 - Quiet Wilderness (pg.8)

The musical score for 'Quiet Wilderness' (pg. 9) consists of four staves: Voice, Violin, 5 string Violin, and Cello. The score is divided into two systems, each starting at measure 71.

System 1 (Measures 71-74):

- Voice:** Measures 71-74. Melody with triplets in measures 71 and 73. Lyrics: "peo - ple go around you. It's im - pos - si - ble to su - press. And".
- Violin:** Measures 71-74. Continuous eighth-note accompaniment.
- 5 string Violin:** Measures 71-74. Chords: C (measures 71-72) and A m (measures 73-74).
- Cello:** Measures 71-74. Bass line with eighth notes and rests.

System 2 (Measures 75-78):

- Voice:** Measures 75-78. Melody. Lyrics: "we grow on high - ways, and we grow in the ash - es, and".
- Violin:** Measures 75-78. Continuous eighth-note accompaniment. Marking: *col legno battuto*.
- 5 string Violin:** Measures 75-78. Chords: C (measures 75-76), A (measures 77-78), C (measures 79-80), G (measures 81-82). Marking: *normale Use these two notes to improvise around.*
- Cello:** Measures 75-78. Bass line with whole notes. Marking: *col legno*.

Figure 7.1 - Quiet Wilderness (pg.9)

10

79

Voice

79

we grow on the cliff sides. We wake the sick and sleep the dead. We wake the

Violin

79

5 string Violin

79

C A G C

Cello

83

J

Voice

83

sick and sleep the dead.

Violin

83

repeat and fade, then cue end

5 string Violin

83

G A C A C A m

repeat and fade until cue

Cello

repeat and fade until cue

Figure 7.1 - Quiet Wilderness (pg.10)

Civilization

Cassie Norton

♩ = 110

A1 C#m D#m

5 string Violin

arco solo

Cello

arco

Use this part as a guide for improvised accompaniment in all A sections. Feel free to make alterations and embellishments.

5

Violin

3

C#m B m A 7

5 string Violin

play what is written

Cello

C#m B m A 7 G#7b9#9#11 3

9

3

Voice

ci vi - li - za - tion turn - bles like wa - ter, down the win - dow pane ___ of time, ___

Violin

9

5 string Violin

pizz.

Cello

C#m D#m

Figure 7.2 - Civilization (pg.1)

The musical score for 'Civilization' (pg.2) is presented in two systems. The first system covers measures 13 to 16, and the second system covers measures 17 to 20. The score is written for Voice, Violin, 5 string Violin, and Cello. The key signature is three sharps (F#, C#, G#) and the time signature is 4/4.

System 1 (Measures 13-16):

- Voice:** Measures 13-16. Lyrics: "gather - ing all the wild and free, in, it's ho - mo - ge - ny. The". Measure 16 features a triplet of eighth notes.
- Violin:** Measures 13-16. Measure 16 features a half note chord.
- 5 string Violin:** Measures 13-16. Measure 16 features a half note chord labeled "arco".
- Cello:** Measures 13-16. Chords: C#m (measures 13-14), B m (measure 15), A 7 (measure 16), G7b9#9#11 (measure 16).

System 2 (Measures 17-20):

- Voice:** Measures 17-20. Lyrics: "weight of the world is the weight of the word - less. Word - less thoughts will al - ways de scribe, ___". Measure 20 features a triplet of eighth notes.
- Violin:** Measures 17-20. Measure 17 features a "chop" (choppy) marking. Measures 17-20 feature a rhythmic pattern of eighth notes with 'x' marks indicating specific notes.
- 5 string Violin:** Measures 17-20. Measure 17 features a "pizz." (pizzicato) marking. Measures 17-20 feature a rhythmic pattern of eighth notes.
- Cello:** Measures 17-20. Chords: C#m (measures 17-18), D#m (measures 19-20).

Figure 7.2 - Civilization (pg.2)

B1

The musical score is divided into two systems. The first system (measures 21-24) features a vocal line with lyrics: "all the sounds, all the smells, all the tastes, that make us, a -". The instrumental parts include Violin (marked *normale*), 5 string Violin (marked *arco*), and Cello (with chords $C\sharp m$, $B m$, and $A 7$). The second system (measures 25-28) features a vocal line with lyrics: "live. ____ So try to hold on to this day, and don't ____ for get, ____". The instrumental parts include Violin (marked *pizz.*), 5 string Violin (marked *subito p*), and Cello (marked *subito p*).

21

Voice

all the sounds, all the smells, all the tastes, that make us, a -

21

Violin

normale

5 string Violin

arco

subito p

Cello

$C\sharp m$ $B m$ $A 7$

subito p

25

Voice

live. ____ So try to hold on to this day, and don't ____ for get, ____

25

Violin

pizz.

5 string Violin

subito p

Cello

subito p

Figure 7.2 - Civilization (pg.3)

The musical score for 'Civilization' (pg. 4) is presented in two systems. The first system covers measures 29 to 32, and the second system covers measures 33 to 36. The score is written for Voice, Violin, 5 string Violin, and Cello. The key signature is one sharp (F#), and the time signature is 4/4.

System 1 (Measures 29-32):

- Voice:** Measures 29-30: "all the things that you can't say". Measure 31: Rest. Measure 32: "eh eh eh eh".
- Violin:** Measures 29-32: Continuous eighth-note accompaniment.
- 5 string Violin:** Measures 29-32: Sustained notes with a crescendo line.
- Cello:** Measures 29-32: Sustained notes with a crescendo line.

System 2 (Measures 33-36):

- Voice:** Measures 33-36: "da da da da da da da da da da da da da da da da".
- Violin:** Measures 33-36: Continuous eighth-note accompaniment.
- 5 string Violin:** Measures 33-36: Sustained notes with a crescendo line. A *subito p* marking is present at the start of measure 34.
- Cello:** Measures 33-36: Sustained notes with a crescendo line. A *subito p* marking is present at the start of measure 34.

Figure 7.2 - Civilization (pg.4)

37

da da da da

arco chop

pizz. arco portamento

Play what is written or solo.

3

portamento normale

41

Violin

5 string Violin

Cello

D#m

C#m

3

Figure 7.2 - Civilization (pg.5)

6 Civilization

45

Voice

Things like bombs have

Violin

normale chop

5 string Violin

B m A 7 G#7b9#9#11 C#m

play what is written pizz.

Cello

B m A 7 G#7b9#9#11 C#m

49

Voice

words to de-scribe them like nu-cle-ar fu - sion and cri - ti - cal mass, but the sounds they make, the

Violin

5 string Violin

D#m C#m

Cello

Figure 7.2 - Civilization (pg.6)

Civilization B2 7

53

Voice

lives they take, the mess they cre - ate, leaves be - hind, a word - less state.

Violin

normale

pizz.

5 string Violin

arco

subito *p*

improvise an accompaniment to the cello solo

Cello

B m

A 7

G

D

subito *p*

solo using these guide tones

57

Violin

5 string Violin

subito *p*

Cello

subito *p*

E m

B m

E m

B m

Figure 7.2 - Civilization (pg.7)

Violin

5 string Violin

Cello

61

A7

G

D

solo using these guide tones

improvise an accompaniment to the violin solo

65

Em

B m

subito *p*

Em

B m

subito *p*

Figure 7.2 - Civilization (pg.8)

The musical score is divided into two systems. The first system (measures 69-72) features a Voice part with lyrics "The peo - ple I know, have" and a Violin part with a rhythmic pattern of eighth notes. The 5 string Violin and Cello parts provide harmonic support with chords A7, G#°, and C#m. The second system (measures 73-76) features a Voice part with lyrics "words to de-scribe them like sis-ter and mo ther, lo-ver and bro-ther. But the sounds they make, the" and a Violin part with a rhythmic pattern of eighth notes. The 5 string Violin and Cello parts provide harmonic support with chords D#m and C#m. A box labeled "A3" is present above the Voice staff in the first system.

69

Voice

The peo - ple I know, have

Violin

5 string Violin

Cello

A7

G#°

C#m

pizz.

73

Voice

words to de-scribe them like sis-ter and mo ther, lo-ver and bro-ther. But the sounds they make, the

5 string Violin

Cello

D#m

C#m

A3

Figure 7.2 - Civilization (pg.9)

77

Voice

breaths we take, the love we cre-ate, leaves be-hind, a word-less state.

Violin

arco

subito *p*

5 string Violin

arco

subito *p*

Cello

B m

A 7

subito *p*

81

Voice

ah ah ah ah

Violin

pull

subito *p*

5 string Violin

pull

subito *p*

Cello

pull

subito *p*

Detailed description: This is a musical score for the piece 'Civilization' on page 10. The score is written for Voice, Violin, 5 string Violin, and Cello. The key signature is three sharps (F#, C#, G#). The score is divided into two systems. The first system starts at measure 77 and ends at measure 80. The second system starts at measure 81 and ends at measure 84. In the first system, the Voice part has the lyrics 'breaths we take, the love we cre-ate, leaves be-hind, a word-less state.' The Violin and 5 string Violin parts are marked 'arco' and 'subito p' (piano). The Cello part has a 'B m' (B minor) chord at measure 77 and an 'A 7' (A dominant 7th) chord at measure 78, followed by 'subito p'. In the second system, the Voice part has the lyrics 'ah ah ah ah'. The Violin and 5 string Violin parts are marked 'pull' and 'subito p'. The Cello part is marked 'pull' and 'subito p'.

Figure 7.2 - Civilization (pg.10)

88

Voice

ah ah ah ah ah ah ah ah

Violin

subito p

5 string Violin

subito p

Cello

subito p

92

Voice

ah ah ah ah ah ah ah ah

Violin

cresc.

5 string Violin

pause last time only x4

sing "ah's" on second repeat

Cello

pause last time only x4

sing "ah's" on the third repeat

Figure 7.2 - Civilization (pg.11)

Has to be Finished

Cassie Norton

Intro ♩=160

Violin 1

Violin 2

pizz. start sparse, gradually build the texture until the voice enters

5 A

Voice

Rum-bling a-round me, this town is ram-bl-ing. This is the year the land will de-cay.

Violin 1

Violin 2

continue with the texture established in the previous section

Cello

pizz. sparse

9

Voice

Eve-ry-one's wor-king, has to be fi - nished. Yes-ter-day can-not keep up to to-day.

Violin 1

Violin 2

Cello

Figure 7.3 - Has to be Finished (pg.1)

13 A1

Violin 1 *arco sul ponticello*
A m D° A m E7 A m D° A m E7

Violin 2 *arco sul ponticello*
A m D° A m E7 A m D° A m E7

Cello *tacet*
A m D° A m E7 A m D° A m E7

17

Violin 1 A m D° A m E7 A m D° A m E7 A m

Violin 2 A m D° A m E7 A m D° A m E7 A m

Cello *arco sparse*
A m D° A m E7 A m D° A m E7 A m

21 B

Voice
Time is not free. You pay for what you take. You can't go slow. We will fi - nish.

Violin 1 *normale*
21

Violin 2 *normale*

Cello

Figure 7.3 - Has to be Finished (pg.2)

C double time ♩=320

Violin 1
Improvise in the 5th mode of A harmonic minor
ruboto
cue to next section

Violin 2
Improvise in the 5th mode of A harmonic minor
ruboto
violin 1 cue

Cello
Improvise in the 5th mode of A harmonic minor
ruboto
violin 1 cue

A2 31

Violin 1
improvise a chordal accompaniment

Violin 2
improvise a chordal accompaniment

Cello
improvise a chord root based accompaniment

B1 39

Violin 1
improvise a chord based melody

Violin 2
improvise a chord based melody

Cello
improvise a chord based melody

Chord progressions for sections A2 and B1:

Section	Measure	Violin 1	Violin 2	Cello
A2	1	A m	D°	A m
	2	A m	E7	A m
	3	A m	D°	A m
	4	A m	E7	A m
	5	A m	D°	A m
	6	A m	E7	A m
	7	A m	D°	A m
	8	A m	E7	A m
B1	1	D m	A m	D m
	2	A m	B7	A m
	3	B7	E7	B7
	4	E7	D m	E7
	5	D m	A m	D m
	6	A m	B7	A m
	7	B7	E7	B7
	8	E7	D m	E7

Figure 7.3 - Has to be Finished (pg.3)

4 Has to be Finished

A3

47

Violin 1

Violin 2

Cello

improvise a chord based melodic counterpoint

B2

55

Violin 1

Violin 2

Cello

improvise a chord based melody

C2

63

Violin 1

Violin 2

Cello

Improvise sounds of construction and demolition

The musical score is for a piece titled "Has to be Finished". It is divided into three sections: A3, B2, and C2. Section A3 (measures 47-54) features Violin 1 with a melodic line and Violin 2/Cello with a chordal accompaniment. Section B2 (measures 55-62) features Violin 1 with a melodic line and Violin 2/Cello with a chordal accompaniment. Section C2 (measures 63-64) features all instruments with a melodic line. The score includes various musical notations such as notes, rests, and chords.

Figure 7.3 - Has to be Finished (pg.4)

65 **Intro 2**

Violin 1

Violin 2

Cello

pizz. start sparse, gradually build the texture until the voice enters

69 **A4**

Voice

Rum-bling a-round me, this town is ram-bl-ing. This is the year the land will de-cay.

Violin 1

Violin 2

Cello

pizz. sparse

73

Voice

Eve-ry-one's wor-king, has to be fi-nished. Yes-ter-day can-not keep up to to-day.

Violin 1

Violin 2

Cello

Figure 7.3 - Has to be Finished (pg.5)

Yellow Flowers

Form: A A1 A2 A3 B B1 B2 A4 A5

Chords for the A part in 3/4 time:

Em		G		
Em	C	D		
Em		G		
Em	D	G		

Chords for the B part in 4/4 time:

Em	Em	G		
Em	D	G6		
Em	Em	G		
Em	D	G		

Intro (A): violin 1 - Play a pizzicato melody over the chord progression.

cello - Enter with a pizzicato accompaniment on beat 3 of measure 7 and beat 1 of measure 8, and then again on beat 3 of measure 11, and beat 1 of measure 12, this time staying in for the final phrase of the introduction.

Verse 1 (A1): violin 1, violin 2 and cello - Play a pizzicato accompaniment to the voice.

*Well I don't know where you're going,
You can't remember where you've been,
so I dreamed you a field of yellow flowers,
to lay your head down in.*

Verse 2 (A2): violin 1 and violin 2 - Play an arco accompaniment.

cello - Continue with the pizzicato accompaniment.

*Well time is falling inwards.
Thoughts grow closer every day.
May death be a sweet angel,
who takes the fear away.*

Figure 7.4 - Yellow Flowers (pg.1)

Verse 3 (A3): violin 1 and violin 2 - Continue with the arco accompaniment.

cello - Switch to an arco accompaniment.

violin 1 - Cue a time signature change to 4/4 on the word "all" in the last line.

*Well in life we must make choices,
some big and others small,
but death grants us the freedom,
to make no choice at all.*

Cello Solo (B): cello - Play a solo, violin 1 and violin 2 - Play accompaniment.

Violin 2 Solo (B1): violin 2 - Play a solo, violin 1 and cello - Play accompaniment.

Verse 4 (B3): violin 1, violin 2 and cello - Provide accompaniment to the voice.

violin 1 - Cue a time signature change back to 3/4 on the word "ever."

*Now your thoughts are free to travel,
to untangle, and unwind.
Memories are all that's left now.
An ever expanding mind.*

Verse 5 (A4): violin 1, violin 2 and cello - Provide gentle accompaniment to the voice with more melodic fills than in the first three verses.

*May you rest just like a child,
whose mind is free from fear.
Running through fields of yellow flowers,
in the spring time of the year.*

Outro Melody (A6): violin 1 - Play the melody of the A part with artificial harmonics.

violin 2 and cello - Play a gentle accompaniment with melodic fills, similar to the accompaniment provided in verse 5.

Figure 7.4 - Yellow Flowers (pg.2)

Chapter Eight: Conclusion and Recommendations

This paper explores a number of approaches to performing, improvising and composing for the violinist/singer. In the first chapter the unique qualities of violin and voice are defined, and the challenges of combining them as one person is summarized. The second chapter presents a series of exercises which focus on vocal technique using the violin as primarily an accompaniment instrument. The third chapter presents a series of exercises which focus on the blend between the violin and the voice using the resonance of the violin as a guide. The fourth chapter presents a series of exercises focusing on rhythm for practice with violin and voice. Chapter four also defines some ways in which the violin can function as a rhythmic accompaniment instrument. Chapter five presents a series of improvisation exercises to practice melodic counterpoint between violin and voice. Chapter five also defines some of the ways in which the violin can be used as a harmonic accompaniment instrument, and it proposes some strategies to approach voicing and voice leading on the violin. Chapter six includes a series of studies and short pieces for violin and voice, the content of which both inform and is informed by the exercises in the previous chapters. Chapter seven includes a series of scores, charts and recordings of pieces written for Cassie Norton (myself) on violin and voice, Emilyn Stam on five string violin and Eli Bender on cello.

This paper does not explore violin vibrato or vocal vibrato as specific timbral characteristics. Violin vibrato is useful as a timbral effect but is a difficult sound to match with the voice. It also requires that the violin be held relatively firmly with the jaw, which constricts the vocal instrument. I do not have a natural vibrato in my voice and do not understand how vibrato works in the voice.

Understanding how to produce vibrato in the voice is a necessary first step towards developing exercises for blending vocal vibrato with violin vibrato. The limitation of my voice at this time, in combination with the extra physical challenges involved in the production of violin vibrato, make exploration of vibrato between the violin and voice beyond the scope of this project. However, this is something I would like to explore in future practice and research.

Another area of research not explored at all in this paper is the possibility of overtone singing with violin. Mongolian throat singing is often accompanied by the *morin khuur*, a traditional Mongolian fretless bowed string instrument. Overtone singing with violin accompaniment could be explored and incorporated in to my own work through research into this musical practice. This is something that I have already begun to explore in my personal research and practice, but due to the need to thoroughly pursue the other topics in this paper, I have not been able explore it as deeply as I would have liked. It is certainly something I would like to research more in the future.

This paper has informed my teaching in a number of ways. For example, I am much more aware of my violin students audiation, and I often use singing as a route towards clearer intonation. However, I am not yet comfortable enough with the exercises themselves to use them in my teaching. Most of the exercises in this paper could be adapted to form a method for teaching violin and voice. Many of the exercises could be adapted for teaching violin, and some of the exercises could be adapted for use in general musical contexts.

There are a number of violinist/singers who I have looked to for inspiration - the most notable being Iva Bittova, Karla Kilstedt, Andrew Bird and Owen Pallet. Throughout the writing of this paper I have also been strongly influenced and inspired by fiddle accompaniment traditions through Eli Bender, Emilyn Stam and, less directly, Oliver Schroer and Bruce Molsky. However, I have not completed a rigorous analysis of any of their work. Transcription and analysis of this music would be another way of approaching the challenges in this paper.

The compositional and improvisational possibilities for violin and voice are just touched on in chapters six and seven, but these areas could be much more thoroughly explored once the technique of playing and singing are more stable. The complexity of the compositions in chapters six and seven do not explore all of the possibilities practiced in the exercises. A study of improvisation based on the concept of glissando would build on the technique practiced in chapter 3.3. A study with frequent meter changes or multiple subdivision groups between the violin and voice would build on material from 4.1 and 4.2. A study in which the violin and voice are completely independent rhythmically, or

a study in canon would build on material from chapter 5.1.

In general, the degree to which I am able to improvise with violin and voice at the same time is still fairly rudimentary, but it has improved substantially since the inception of this project. At the onset of my work on this paper, I hoped to incorporate into my songwriting the kind of freedom and flexibility that I have as a violinist. I had also hoped to develop the ability to improvise vocally with my voice and violin. Throughout this work I have incorporated violin into my songwriting in many ways that, previously, I would not have had the ability to perform. I have also begun to use a combination of violin and voice in performance with other musicians in both improvised and arranged contexts. The process of developing the exercises in this paper have shown me possibilities for performance with violin and voice that I previously had not imagined. Although there is still a great deal of work to be done towards proficiency with singing and playing violin, the exercises developed in this paper have given me the tools to work towards improvisations and compositions of greater clarity, complexity, and emotional authenticity with violin and voice.

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Appendix A - International Phonetic Alphabet

Vowels

	IPA Symbol	Sound	As in
Forward Vowels (slightly stretched lips)	[i]	ee	meet
	[ɪ]	ih	mitt
	[e]	a (y)	day (leave off "y")
	[ɛ]	eh	met
	[æ]	a	mat
	[a]	(bright) ah	why (with a Southern accent)
Back Vowels (rounded lips)	[u]	oo	too
	[ʊ]	oo	took
	[o]	oh	go
	[ɔ]	aw	saw
	[ɑ]	ah	father
Central Vowels (neutral lips)	[ʌ]	uh (stressed)	under
	[ə]	uh (unstressed)	<u>a</u> bove
	[ɜ]	er (r)	her
	[ɝ]	er	summer <u>er</u>
	[ʊ]	ur	girl
Diphthongs	[eɪ]	ai or ay	day
	[oʊ]	o	owe
	[aɪ]	I	night
	[aʊ]	ou or ow	out
	[ɔɪ]	oi or oy	boy
	[ju]	ew	use

Figure A1 - IPA for English Vowels adapted from (Sheppard, 278)

Consonants

IPA Symbol	Sound	As in
[p]	p	pit
[b]	b	big
[t]	t	ton
[d]	d	dog
[k]	k	kitten
[g]	g	get
[m]	m	move
[n]	n	not
[ŋ]	ng	sing
[f]	f	foot
[v]	v	very
[θ]	th (unvoiced)	thought
[ð]	th (voiced)	there
[s]	s	sat
[z]	z	zipper
[ʃ]	sh (unvoiced)	shadow
[ʒ]	sh (voiced)	pleasure
[h]	h	hot
[l]	l	land
[r]	r	ready
[j]	y	you
[hw]	w (unvoiced)	where
[w]	w (voiced)	way
[tʃ]	ch (unvoiced)	choose
[dʒ]	j (voiced)	edge

Figure A2 - IPA for English Consonants adapted from (Sheppard, 278)

Appendix B - Violin Articulations

The type of articulation affects the way rhythm is expressed on the violin. Some rhythms are better or more easily expressed with one type of articulation than another. There are four main variables that effect articulation in the bow: speed of the bow, pressure of the bow, angle of the bow and how long a note is sustained. The violinist plays with these parameters to produce a large range of articulations. The more common types of articulations are codified as specific bow techniques. Although terms are useful for referring to specific established bow techniques it is also important to understand the variables affecting bow articulation. Understanding the variables allows the violinist to be more flexible with established techniques, as well as to vary or even invent techniques based on the requirements of the music. Some common bowing techniques are identified below.

Staccato and Legato - *Staccato* means that notes are detached and articulated, either with just with silence or with some other sort of accent. In a score, the term *détaché* is often used in place of *staccato*. *Legato* means that notes are connected without any intervening silence or articulation. The most absolute *legato* sound is created through connecting two or more notes in a single bow stroke. Achieving a completely *legato* sound through a change in bow direction is more difficult. *Staccato* and *legato* are general musical terms used to describe articulation. Most bow techniques can be classified on the spectrum between *legato* and *staccato*, along with another distinct articulatory quality not necessarily related to the degree of separation between one note and the next. Due to the universality of the terms *staccato* and *legato* categorizing bow articulations by degree of *staccato* or *legato* is helpful in understanding their musical relevance.

Martelé - The term *Martelé* literally means "hammered," and is a type of *détaché* stroke with a lightly hammered attack.

Collé - The term *collé* literally means "stuck," or "glued." This articulation is created by beginning the bow stroke from a complete stop, applying a lot of weight to the bow at the onset, and continuing with a relatively slow heavy bow speed. Ideally, the initial weight/bow speed combination will be on the verge of causing a scratch sound.

Spicatto - *Spicatto* is a short light detaché bow stroke created by bouncing the bow hair on the string. *Spicatto* is usually performed at the balance point⁶⁷ of the bow. In this paper spicatto will be indicated by a small dot under each note in conjunction with the word "spicatto" at the beginning of a group of notes.

Sautille - *Sautille* is a bow stroke played lightly and rapidly near or at the balance point or the bow, with one bowstroke per note so that bow bounces slightly on the string. *Sautille* and *spicatto* are very similar bowstrokes.

⁶⁷ The balance point is the middle of the bow in terms of weight. The bow is the same weight on either side of the balance point. The lower half of the bow is heavier, so the balance point is closer to the lower half than the upper half of the bow.

Spicatto is usually performed faster with less bow, and more often at the balance point, as the bounce is essential for the sound.

Ricochet bowing or Jeté - *Ricochet bowing* involves "throwing" the bow on the string in the upper third of the bow on a down bow, so that it bounces and produces a series of rapid notes in a single bow stroke.

Loure and Pulling - *Loure* is a bow technique which separates slurred notes slightly to articulate them without fully stopping the bow. In western art music this bow technique is almost always used in slow passages of a *cantabile*⁶⁸ character. *Pulling* is a term used by fiddle players to describe an almost identical technique used in accompaniments to a more melodic part, either sung or played on another instrument. *Pulling* is almost always combined with double stops⁶⁹ but is not always done at a slow tempo. *Pulling* will be indicated in this paper with the word "pull" in combination with a semi-detached articulation. Please see example (*figure A3*)



Figure A3 - Pull Notation

Rolling⁷⁰ *Arpeggio* - A rolling arpeggio is a bow stroke, played on broken triple or quadruple stops, so that each note of the arpeggio is played on a different string.

Arppeggiando or bouncing arpeggio - *Arppeggiando* can be described as a rolling bow stroke combined with a *riccochet* bowing, initiated on the downstroke, and continued on the upstroke.

Bariolage - *Bariolage* is a French term which means "odd mixture of colours." This effect is created by playing the same pitch or pitches consecutively on different strings. In western art music *Bariolage* is often used in conjunction with some type of rolling or bouncing arpeggio. In many fiddle styles (North American, Eastern and Western European) *bariolage* is often used in conjunction with double stops.

Tremolo - *Tremolo* consists of moving the bow back and forth in very short strokes. *Tremolo* can be measured or unmeasured. In composed music this decision is often left to the performer.

Col legno - *Col legno* means playing on the strings directly with the wood of the bow. *Col legno* can be combined with other bow strokes to produce various effects.

Col legno battuto - *Col legno battuto* means bouncing the wood of the bow on the strings.

68 "Cantabile" describes a smooth singing style.

69 "Double stops" mean playing two strings at once.

70 The term "rolling" was added by the author to specify the type of arpeggio implied in this bow technique. Other than arpeggio or arpeggiated there is no other common practice term to describe this type of articulation.

Sul Ponticello - *Sul ponticello* involves bowing near or on the bridge of the violin to produce a range of undetermined upper partials which colour and sometimes completely obscure the fundamental, depending on how much bow pressure is applied and the bow's proximity to the bridge.

Sultasto or Flautando - *Sultasto* involves bowing over the fingerboard. This limits the resonance of the note being played. The fundamental has less harmonic content when bowing over the fingerboard than when bowing between the bridge and fingerboard (bow placement for most bow techniques).

Pizzicato - *Pizzicato* simply means plucking the strings with the fingers instead of bowing them. It is not a bowing technique, but provides an interesting contrast to bowing articulations. Because there is no sustain and only limited control in terms of attack there are less defined varieties of *pizzicato* articulations.

Chopping - *Chopping* is a percussive technique in which the hair near the frog of the bow is struck against the strings producing a quick scratching sound of indeterminate pitch. It was popularized in the folk fiddle scene by bluegrass fiddler Richard Green in the 1960s and brought into contemporary fiddle styles by Darol Anger in the 1980s (Risk, abstract). *Chopping* patterns are often inspired by rhythmic patterns played on drums or percussion instruments and are often used in place of percussion or drums. In this paper, basic chop is indicated with an "x" note head. Please see *figure A4*.



Figure A4 - Chop Notation

Appendix C - Approaches to Internalizing Subdivisions

Many approaches exist for internalizing subdivisions. In western art music students are often advised to audiate pulses by counting and to audiate subdivisions with some other syllable. For two pulses in a measure we count "one - two," for three pulses we count "one - two - three" and so on. For an even subdivision of one beat by two, we count "one - and," and for an even subdivision of one beat but four "one - e - and - a." In 2/4 time we would count "one - and - two - and" for an even subdivision of the beat by two, and "one - e - and - a - two - e - and - a" for an even subdivision of the beat by four. There are many other methods used in western art music pedagogy for internalizing pulse and subdivisions, but none of those in common use are very comprehensive and are not useful for internalizing complex rhythmic structures. Another problem with most of these approaches is that they involve numbers. The sound of the numbers themselves may interfere with feeling the rhythms accurately because they all have different types of articulations associated with them, giving each of their respective pronunciations unequal stress. Also using numbers to audiate pulse and subdivision occupies the mathematical mind which might be needed for other things, like preparing interval choices or phrase structures.

Solkattu, an ancient system from South India is used to teach drum patterns, and is also used as a form of percussion in its own right⁷¹ is a much more comprehensive way to internalize rhythmic structures.

(Sankaran, 1) Solkattu is an ideal approach to internalizing subdivisions because it can be used to internalize very complex rhythms and doesn't require the audiation of numbers. Groups of subdivisions

⁷¹ When *solkattu* is performed as a musical art it is called *konnokol* (Sankaran, 1)

are paired with specific syllable sets to create spoken rhythms that are both easy to conceive and easy to say quickly. For example a group of four subdivisions per pulse can be assigned the syllables "ta ka di mi." One syllable is assigned to each subdivision, and all of the syllables in the set are easy to say in order. Pulses are generally counted on the fingers and with hand motions, allowing the body to do the counting, rather than the mind. Counting with the hands is not possible when playing most musical instruments. However the concept of counting with the body, rather than the mind can be transferred to other places in the body, just by making a repetitive motion with the same number of different parts as the meter being counted. The chart below is an overview of solkattu syllables the author has found most useful for internalizing subdivisions.






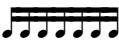
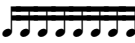
subdivisions per pulse	western notation	solkattu syllables
2		"Ta ka"
3		"Ta ki ta"
4		"Ta ka di mi"
5		"Ta ka ta Ki ta" or "Ta ding gi na tom" or "Ta di ki Ta do"
6		"Ta ka di mi Ta ka " or "Ta ki ta Ta ki ta"
7		"Ta ka di mi Ta ki ta"
8		"Ta ka di mi Ta ka jo nu" or "Ta ka di mi Ta ka di mi"

Figure A5 - Chart of Rhythmic Vocalizations

Appendix D - The Chord Identifying System Used in this Paper

In this chord labelling system the name of a chord type is shortened to three letters. The short hands used are maj for major, min for minor, aug for augmented, sus for suspended and dim for diminished. For triads, maj and min refer to the third of the triad, and aug. and dim. refer to the fifth. For seventh chords the labelling generally refers to both the third and the seventh of the chord or both the fifth and the seventh of the chord. For example a chord labelled "maj7" has a major third and a major seventh, a chord labelled "minMaj7" has a minor 3rd and a major seventh, while a chord labelled "diminished" has a diminished fifth and a diminished seventh. The one exception to this rule is the major minor chord (major third, perfect fifth, minor seventh) which is just labelled with a "7." Another exception to the rule in this labelling system is the half diminished seventh chord (minor third, diminished fifth, minor seventh), which is simply labelled "halfdim." For the labelling of sixth chords the abbreviation refers to the third of the chord. Chord extensions greater than seven replace the 7 after the abbreviation specifying the chord type if there is no alteration to the extension. This means that all of the thirds up until the extension indicated should be technically be included in the chord. If there is an alteration to the extension, the highest unaltered extension is written first followed by the alteration.

chord symbol	chord type	intervals included in the chord
aug	augmented (aug refers to the fifth)	1-3-#5
maj	major triad (maj refers to the third)	1-3-5
min	minor triad (maj refers to the third)	1-b3-5
dim	diminished triad (dim refers to the fifth)	1-b3-b5
sus4	suspended chord with a fourth above the root	1-4-5
sus2	suspended chord with a second above the root	1-2-5
maj7	major third, major seventh	1-3-5-7
7	major third, minor seventh	1-3-5-b7
min7	minor third, minor seventh	1-b3-5-b7
minMaj7	minor third, major seventh	1-b3-5-7
halfdim	minor third, diminished fifth, minor seventh	1-b3-b5-b7
dim7	minor third, diminished fifth, diminished seventh	1-b3-b5-6
min6	minor third, major sixth	1-b3-5-6
minb6	minor third, minor sixth	1-b3-5-b6

Figure A6 - Chord Symbols and their Meanings